**SABER Reviewer Training Materials 2023**

**Reviewer logistics:**

1. Fill out the Google form sent out by SABER requesting reviewers.
2. Create a [CMT account](https://cmt3.research.microsoft.com/User/Login?ReturnUrl=%2F) (if you don’t already have one).
3. Receive an email from CMT (sender is Microsoft CMT - check junk mail!) asking you to enter areas of expertise (and once in system and what types of submissions you are willing to review). The wording of the 2023 [email might look something like this](https://docs.google.com/document/d/17_HpsmiHKBYY1J7l6qFUabglkkfqNGpFbIJa2UdfU0g/edit?usp=sharing).
4. Receive email from Microsoft CMT indicating reviewer assignment - login to see abstracts for reviewing.

**General Tips:**

* Each component of the rubric will ask you to rate the component on a scale of 1 (low) to 3 (high). **When thinking about what rating you are going to give and why, jot down some specific notes on why you are deducting points or why you think it is good enough to warrant a 3.** You will be required to enter written comments for each of the four major sections of the rubric, so these notes will be critical for completing this section. These comments will be useful to the author, but also useful to the abstract committee if we find major discrepancies between reviewer scores.
* Some of the rubric components may be dependent on other rubric components. For example, rating the extent to which the design and methods are appropriate and well-aligned with the research question depends on whether you understand their research question. Therefore, you may end up deducting points on one component of the rubric that refers to another component of the rubric that was poorly done. However, again, just be very clear in your comments why you are not giving them a 3.
* If you are reviewing the poster abstracts, the character limit for these is very short, so the information presented might not be as thorough. In these situations, your comments are going to be very valuable, and you might want to start your comments by recognizing the character limit (e.g., I realize the character limit for poster abstracts was short, but…). All posters will be accepted! Therefore, the reviews are primarily for feedback to the authors.
* Multiple reviewers will be rating each talk, and the abstract committee will be looking at all of the reviews. So if your review is an outlier, it’s ok - you alone are not going to be the reason why someone is not granted a talk.

**Things to think about in each section:**

* Study Context Section:
  + Is there enough background for you to understand the study? Have they used in-text citations to provide support for their statements?
  + Is there a clear reason or need that has been iterated for why this study needed to be done?
  + Have the researchers described a model or a philosophy for how they think things work that the study is situated in? Or, have the authors situated their study within a theoretical framework?
* Research Design Section:
  + Were research questions or objectives included? Do they make sense or are some of them confusing to understand?
  + Is there enough detail to understand what was being measured, how it was measured, and who it was measured on? For qualitative studies, is there enough detail to understand how they obtained qualitative data and who they obtained data from?
  + Are the methods appropriate to address the research questions? Or is there some ambiguity in whether these methods get at the research questions perhaps because either the methods are unclear or the research questions are unclear?
* Analyses and Interpretation Section:
  + Did they describe how they analyzed the data they obtained - either quantitatively or qualitatively? Was this description clear enough so that you understand what they did?
  + Did they describe the results clearly? Do the claims made based on quantitative or qualitative analyses align with the results they present? Did they back up their results with statistical evidence or quotes?
  + Level of completeness will vary depending on what is being reviewed. Posters and Roundtables may only have preliminary data, so they shouldn’t be docked points for not reporting out statistics or quotes. Short talks should have “robust findings” - so data analyses should be complete and presented in the abstract. Long talks should be a synthesis of multiple studies and should have analyses of multiple studies presented in the abstract.
* Contribution Section:
  + Does the author explain how it will add to the literature? Perhaps the author suggests a knowledge gap that this fills or explains how it hasn’t been looked at in this particular way or with this particular population? You should not have to guess on this - this should be clearly stated in the Contribution section.
  + Do you think this is a topic of interest to those doing biology education research? Do you think this is a topic of interest to those using evidence-based approaches to teaching biology? Or perhaps it is too narrow to engage folks from either of these groups?
  + Does the author explain how what they found in their study applies to what can be done in the classroom or how it may help others in conducting research? Is this clearly explained? You should not have to rely on your own knowledge to fill in the blanks - this should be explicitly stated.

**Practice Scoring an Abstract!**

**Directions:**

* Create a copy of the rubric from this Google Sheets version: <https://docs.google.com/spreadsheets/d/1z7ZeP5Woo__5W0ES6X7bzTE6f1hDsNPJ-YbCSVNoZiI/edit?usp=sharing>
* Then, choose an abstract from below (next pages) to score using your rubric. Make sure you include comments about why you gave each section a particular score!
* Once you have scored the abstract, you can compare your scores and comments to Melissa and Lisa’s scores and comments here: <https://docs.google.com/spreadsheets/d/1iLmDfM9szm4HnKbHajVK5gkaSj_iwPyLNz9mPM2UvsA/edit?usp=sharing>
  + It’s okay if your scores are not the same as ours! Different reviewers will pick up on different aspects of an abstract so that scores will likely not be identical. When scores differ drastically, the abstract committee can use the comments to understand why they were scored differently (for example: Did one reviewer pick up on things that other reviewers missed? Or was one reviewer taking off more points than another reviewer for the same issues?)

## ABSTRACT 1 - SHORT TALK SUBMISSION - Quantitative

**Content-focused professional development and higher cognitive demand of curricular tasks elevate teaching assistants’ teaching practices**

BACKGROUND: Science education is changing to prioritize cognitively demanding curricula delivered using student-centered pedagogy (AAAS, 2011). These curricular changes require elevated teaching practices. Professional development (PD) is often required to support instructors implementing reformed curriculum that is student-centered and cognitively demanding. PD is particularly important for graduate teaching assistants (TAs), as they receive little pedagogical training yet are primary instructors for undergraduate courses. It is critical to examine the combined effect of curriculum and PD on TAs’ teaching practices, as effectiveness of PD can depend on the curriculum TAs teach (Addy & Blanchard, 2010). Few studies separately examine the impact of PD and curriculum on TAs’ teaching practices in higher education. The conceptual framework guiding this study draws on work on professional development (Reeves et al. 2016), teacher professional knowledge (Gess-Newsome et al. 2019), and cognitive demand (Stein et al. 1996). RESEARCH QUESTIONS: “How does reformed curriculum interact with curriculum-aligned PD that incorporates modeled teaching practices and opportunities for reflection to affect TA performative and planned teaching practices?” and “How does cognitive demand of curricular tasks affect TA teaching practices?” RESEARCH DESIGN: This study describes the effects of a curriculum and PD intervention on two aspects of TAs’ teaching practices: performative aspects (spontaneous in response to classroom events) and planned aspects (likely to be structured before class). Intervention curriculum featured structured opportunities for reform-oriented teaching practices, and Intervention PD was situated in the context of these specific curriculum activities and modeled the teaching practices TAs were intended to use. Both the intervention curriculum and PD were implemented in a quasi-experimental design in an introductory biology laboratory course (NTraditional = 21, NIntervention = 21). ANALYSES AND INTERPRETATIONS: TAs were recorded while teaching, and recordings were analyzed using the Reformed Teaching Observation Protocol (RTOP). Cognitive demand of the recorded tasks varied across curriculum type, and was determined using the Task Analysis Guide in Science (TAGS). Intervention curriculum and PD had an additive effect on TAs’ teaching practices (measured by RTOP; MTradTrad= 32, MIntTrad= 49, MIntInt= 62, F(2,69)=46.1, Cohen’s f=1.2, p<0.0001). Linear models of TAs’ performative and planned teaching practices that incorporated curricular task type (Traditional or Intervention), PD type (Traditional or Intervention), and the cognitive demand of the observed task indicate that PD has a larger effect on performative practices (eta.sq= 0.15, ß= 0.3) than on planned practices (eta.sq= 0.05, ß= 0.16). Cognitive demand of curricular tasks has the largest effect on both performative (eta.sq= 0.22, ß= 0.4, ) and planned practices (eta.sq= 0.41, ß= 0.6). CONTRIBUTIONS: This study suggests that curricular tasks that are planned to be cognitively demanding provide more structured opportunities for instructors to implement advanced teaching practices. These results suggest while content-focused PD or cognitively demanding tasks individually have an effect, implementing both provides maximum impact on TAs’ teaching practices. findings suggest strategies to prioritize resource allocation when designing PD for TAs.

## ABSTRACT 2 - SHORT TALK SUBMISSION - Qualitative

**Examining the variations in undergraduates’ conceptions of researchers: A phenomenographic study**

BACKGROUND: Undergraduate research experiences play a critical role in training the next generation of scientists; these experiences also increase students’ persistence in science and enhance their cognitive and personal development. However, participation in research requires awareness of existing opportunities and an understanding of the cultural norms within the research community. While some studies have identified the various ways in which researchers understand their profession, few studies have directly examined student conceptions of researchers, and even fewer focused on undergraduates.

RESEARCH QUESTIONS: Given that the norms and values of the research community may be unfamiliar to students, especially for first-generation (FG) college students who lack access to the cultural knowledge of research communities, our study examined how undergraduates experience or conceptualize researchers as a profession, using phenomenography as the theoretical framework. Phenomenography describes the qualitatively different ways that individuals experience, understand, or think about the same phenomenon. Within phenomenography, variation theory formalizes the ways of experiencing a phenomenon into an outcome space with specific features (called “aspects”) that describe the phenomenon, as well as the “variations” within these aspects that define the experiences.

RESEARCH DESIGN: Data were collected from a summer-bridge program aimed at introducing incoming transfer students, who were disproportionately FG (75%), to biological research. To capture a wide range of research experiences, 29 participants were interviewed about two years after the program, near their target graduation date. Participants were asked to give their perception of what a successful researcher is and what a researcher specifically does to be successful. Participants were also prompted to indicate whether their conception of researchers had changed and what specific experiences (or “critical incidents”) prompted these changes.

ANALYSES AND INTERPRETATION: Data were analyzed through iterative close reading of the interview transcripts using grounded theory, which is divided into three major phases of qualitative coding. In open coding, memos and in vivo codes were generated using participants' own phrases that capture critical meanings of a researcher. In axial coding, specific aspects and variations were identified and organized into an outcome space that describes different conceptions of researchers. In selective coding, data for each aspect and variation were revisited to further refine the definitions in the outcome space.

Three conceptions of researchers (Type I, Type II, and Type III) were identified based on variations within the following aspects: research process, interactions with other researchers and broader communities, and scope of contribution. Most participants retrospectively described their initial conceptions of a researcher as simplistic, with little appreciation for the complex methodological processes and extensive collaboration needed to meaningfully contribute to the research community (Type I). However, extensive research experiences had shifted their conceptions. Participants who changed to the Type II conception recognize research as a defined process that requires extensive collaboration and contribution within the research community. The Type III conception includes and expands upon Type II by viewing research as not only a defined but also iterative process that is used to interact with and contribute to both the research community and a broader society.

CONTRIBUTION: The disconnection between the initially simplistic conception of researchers (Type I) and the more mature conceptions (Types II and III) indicates the conflicting expectations that students with limited exposure to research may have prior to their own research experiences. Overall, our findings support the need for broad-scale institutional interventions that engage students in research and provide guidance for transition into research.