2020 STEMwrite Institute for Writing to Learn in STEM Disciplines
University of Minnesota, June 24-26, 2020
Application deadline: February 1, 2020

The 2020 STEMwrite Institute invites faculty teams from biological sciences to a lively and productive three-day institute that focuses on Writing to Learn in STEM disciplines. Grounded in evidence that brief writing assignments have positive impacts on conceptual learning, this institute enables participants to develop brief, conceptually-focused writing activities and assessment tools that can be realistically implemented in large-enrollment, introductory biology courses.

Our goals for the 2020 STEMwrite Institute are:
- To engage participants in a process for developing effective writing-to-learn activities (prompts/assignments, online peer review protocols, and assessment tools) that encourage both durable conceptual understanding and attention to students' development as scientists and science writers.
- To share research findings on drivers and barriers impacting the use of writing in STEM disciplines, based on survey responses of 5,000 STEM faculty at Reinvention Collaborative member institutions.
- To present evidence of the effective implementation of writing-to-learn activities in biological sciences across participant campuses.
- To establish a network of faculty members and researchers interested in participating in a sustained community of practice focused on writing to learn in STEM education.

We invite applications from institutional teams (4-5 members) that include key instructional personnel and faculty in biology and one member charged with improving undergraduate STEM education and/or writing in the disciplines (from campus-wide centers for teaching and learning or writing centers). Participants will leave the STEMwrite Institute with ready-to-use writing to learn prompts and peer response activities that maximize student learning in large classes while minimizing an instructor's response and grading load. Participants will also fashion an assessment plan to evaluate their assignments at their home institutions and action plans to guide subsequent iterations.

<u>**Comments from 2018 and 2019 participants:**</u>

"Each of the sessions was incredibly helpful. We're leaving with our prompt and the assessment prompt almost entirely complete. This is due to the excellent organization, direction, and support provided by all the facilitators."

"I feel MUCH more confident about my ability to do this and my desire to ask students more open-ended questions in a science class. My pre-workshop fear was that it would be too time-consuming to read all of that writing, especially if the questions were trying to promote deeper level thinking and synthesis, and that if I didn't the students would not benefit from the exercise."

"I was highly skeptical that we'd be able to implement a WTL intervention (or even two like we are now planning) into our large, 280-student class. But leaving with the prompts so close to completion has empowered us to pursue and evaluate the impact of these interventions."

"I am more convinced that writing could be implemented effectively in large classrooms that face barriers such as lack of TAships, time constraints, etc."

"The most valuable activities for me have been those in which I interacted with participants from other universities and the embedded experts. Seeing what they are doing and receiving feedback have been most useful."

Description of research and approach

This institute, the second of three annual offerings, draws substantially on an ongoing program of research developed in conjunction with the Reinvention Collaborative and funded by the National Science Foundation. Addressing the Boyer Commission's (1998) call for an increase in research-based pedagogy, and Rivard's (1994) call to understand better the metacognitive processes by which writing activities support conceptual learning, our three-institution team (University of Michigan, Duke University, and the University of Minnesota) is investigating the use of writing activities to help students learn key scientific concepts. This research aims to reveal both the effects of writing to learn interventions on students' conceptual learning gains and the mechanisms by which these learning gains are achieved, including metacognitive awareness and regulation of learning. We take a three-pronged approach:

> 1) using student- and faculty-generated survey data to investigate drivers and barriers to the use of writing-to-learn activities in STEM-based courses.

> 2) partnering with STEM faculty members to identify traditionally troublesome scientific concepts in their courses; develop and implement assignments that target these concepts through engaging students in the process of writing, peer review, and revision.

> 3) assessing changes in students' conceptual knowledge that result from these written interventions. Importantly, our technology-supported intervention encourages student learning and revision and reduces barriers to implementation most often identified by science educators, particularly those teaching large-enrollment introductory courses and labs.

Logistics
The 2020 STEMwrite Institute will be held on June 24th, 25th, and 26th in Bruininks Hall, the University of Minnesota's state-of-the-art science teaching facility.

Support for 4-5 team members to attend the Institute (including lodging accommodations, breakfast, and lunch for the three days of the Institute) and domestic travel will be provided by the NSF grant, "***Accelerating the pace of research and implementation of Writing-to-Learn pedagogies across STEM disciplines.***"

Up to five institutional teams will be invited to attend. **To apply, teams are directed to detail their interest by completing this [application survey](#) by February 1, 2020.** Each application will be reviewed by members of the research team who will look for evidence of applicants' alignment with STEMwrite goals, team composition, and evidence of institutional capacity for implementation. Teams will be notified of decisions by February 14th and asked to register by February 22nd.

Questions can be directed to Leslie Schiff (schif002@umn.edu).