Advocating for Science Writing Cooperatives in Graduate Programs

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Pressure to publish "early and often" and secure grant money for research is an immediate and urgent goal upon entering a graduate program. How we respond to these pressures and our ability to meet such expectations determines our future success as scientists. As graduate students we feel that the pressure to produce high-quality science writing is not matched with the training necessary to succeed as a professional writer. Acknowledging this discrepancy between training and expectations, we formed a peer writing group for developing science writing skills. This experience so profoundly altered our approach to writing that we feel similar groups would be beneficial for every graduate student. Here, we suggest a solution for fostering superior student writing in graduate programs with minimal time investment by establishing *science writing cooperatives*.

The transition from undergraduate to graduate study accompanies a dramatic increase in expectations of our writing abilities with limited structural support. Additionally, the writing process can be isolating, and students often fear the "blank page." Potential barriers to making this transition are numerous across graduate programs. We lack guidance on developing writing skills, have insufficient access to good editing, and perceive that the time investment is not a priority. Our science writing cooperative helped us overcome these barriers. This structured group approach incorporates studying professional science writing and reinforces the acquired skills through peer editing.

As part of our model for the writing cooperative, we used Dr. Joshua Schimel's book *Writing Science*. By presenting the reader with an editing language and clear examples for how to apply this language, Dr. Schimel simplified and enlivened the writing process. We divided weekly meetings into two parts. First, we discussed chapters of the book, identifying specific skills and techniques to improve our writing's structure, flow, and clarity. We then applied those skills to guide our own writing and editing of each other's work. After editing on our own time between meetings, we discussed our suggested edits and changes in writing style with the author of the week. Submission deadlines helped us complete our writing goals—each member successfully completed grant proposals and submitted manuscripts throughout the semester. We recommend using a guiding text, such as *Writing Science*, because it is accessible and replete with simple and effective ways to improve writing. As we began to apply Dr. Schimel's approach to writing in reviewing each other's work, we realized that he presents a universal editing language that can streamline the peer review process. For example, we are now adept at identifying unconscious writing mistakes that are common in science. Many of us tend to overcomplicate the writing—using sophisticated jargon and convoluted grammar—because we think that is the norm. Sometimes a jargon word is the best one to convey a very specific meaning to experts, but since our job is to communicate results, then the best language is that which is most clear and direct.

As professional writers, we need a method to efficiently develop writing skills. Our writing cooperative meets this requirement through its focus on community. Consider how numerous departments and programs offer reading groups with the goal of learning how to gain relevant information and critique ideas and methods in the primary literature. While we value reading groups, there is not the same cooperative emphasis for writing, arguably more important to our development. We discovered that community is the essential ingredient in our model that promotes learning skills, confidence, and time management to break down the barriers to professional writing. This process allows the group members to provide feedback on early drafts, pushing each other to produce lucid written products. Some specific benefits of writing cooperatives are that (1) writing is no longer an isolating process; (2) it is greatly beneficial to develop a common vocabulary for editing so that group members can effectively suggest improvements in their peers' writing; (3) editing and giving feedback strengthens both writing and editing skills, which provide training for reviewing manuscripts for journals or proposals; and (4) deadlines for submitting writing drafts to the group discourage procrastination. Overcoming these writing barriers is a vital step for graduate students.

Our model is also quite flexible. It could easily be molded to fit a rigorous course for credit by including writing and editing exercises, such as those Dr. Schimel outlines for each chapter. One option for a structured writing cooperative includes a supervising faculty member. In our writing cooperative, the faculty member reviewed student writing and submitted her own drafts, thus receiving feedback and benefiting from the process. From her perspective, this provided a benefit far exceeding the investment. Alternatively, the model could work for shorter workshops or upper-division undergraduate students in need of science writing skills.

We also want to emphasize to graduate students that our model was effective because we chose to write and edit proposals and manuscripts that were due during the semester, instead of assigning additional work. The model is therefore ideal for busy graduate students who want to strengthen their writing but feel too busy for another course. We appreciated the minimal time investment for a sizable benefit to our writing.

The importance of effective writing in the sciences cannot be overstated. Graduate students are urged early in their careers to write well and frequently, but provided less opportunity for developing those skills. Informative, compelling writing is integral to a scientist's success and should therefore be facilitated in graduate training. A science writing cooperative is a highly effective way to do this, as it cultivates a community of aspiring scientists driven by a common goal and supported by a common language. Through this, we have each found a degree of confidence in and enthusiasm for our writing that was sorely lacking. We do not fear the blank page and embrace the chance to convey our research to others. Rather than being an additional burden of time and energy, a writing cooperative is a space to give and receive feedback on our current work and develop critical editing and communication skills. We feel that investing in writing development will allow graduate students to confidently share their research and offer a meaningful contribution to the scientific community.