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Part 2: Learning to Communicate About Science: Writing About (Science) Writing and the First-Year Writing Requirement

David Gerstle, Sarah Seeley, and Marc Laflamme

Educating empowered, empathetic, and efficacious citizens involves centering contingent, constructivist, holistic understandings of scientific knowledge. Most importantly, this involves enabling young people to communicate *about* science with innovation and savvy. It enables them, as discussed in Part 1, to become *scientist-citizens*. This is particularly important because most science students do not pursue postgraduate study; rather, they opt to enter the workforce immediately following graduation.

Our research team has come to think about these responsibilities through the lens of a multidisciplinary collaboration that synthesizes our shared concerns about science education, writing program development, and information literacy. This collaboration has resulted in insights on the professionalization of science students in relation to their disciplines, the expectations for science literacy in higher education, and the challenges of revising and bolstering professional communication curriculum where few resources exist. Before offering further discussion of our collective observations, we first provide a brief description of two departmental contexts that shape our work: the Department of Chemical and Physical Sciences (CPS) and the Institute for the Study of University Pedagogy (ISUP), both at the University of Toronto Mississauga (UTM).

The Department of Chemical and Physical Sciences (CPS) is a multidisciplinary academic unit that includes approximately 800 students across the disciplines of Astronomy, Chemistry, Earth Sciences, and Physics. In addition, CPS has a vibrant graduate student research community with 25 full time faculty who mentor approximately 40 graduate students. Similarly, ISUP is a multidisciplinary academic unit consisting of faculty from an array of disciplines that administers foundational skills, numeracy, and first-year writing initiatives. Of particular interest to this discussion is the first-year writing initiative. Our course, *Writing for University and Beyond*, is the first of its kind in Canada: a required FYW course that is administered from the writing about writing approach (Downs and Wardle). At present, this FYW course is required for admission to approximately 50% of the undergraduate programs on the UTM campus. Within the next five years, the course will be required for admission to all degree programs, which will make it a shared feature of the undergraduate experience for all 15,000+ students at UTM. Accordingly, we are now reflecting on several questions, including:

1. How can we forge partnerships within individual departments that will help position the FYW experience as a meaningful springboard into disciplinary writing?
2. How can we mobilize the “and Beyond” portion of the course title as a curricular inroad for public-facing communication strategies that are meaningful to students in an array of disciplines?

While these inquiries do arise from local exigencies, they are also rooted in familiar administrative and curricular pursuits, making them of broader interest to any educator who is working to prepare future scientists to communicate meaningfully with an array of public stakeholder audiences.

As a part of our ongoing work examining both the effectiveness of the FYW program and its relationship to science communication, our research team invited all CPS faculty to sit for individual, dyadic semi-structured interviews; 18 of 25 faculty participated. We chose to interview faculty from a single multidisciplinary science department with the intention of analyzing science faculty expectations for science communication in relation to science student experiences of FYW. Juxtaposing faculty expectations and student experiences allows us to engage with the two research questions outlined above: how to position the FYW experience as a meaningful springboard into disciplinary writing and, accordingly, how to fully mobilize university writing tasks to support students in communicating effectively with the public.

We are still in the early stages of data analysis, but we mention the contours of our larger project to contextualize some observations and discussions. For example, in interviewing CPS faculty, we asked faculty to reflect on the types of writing assignments they currently offer in their courses as well as comment on the extent and type of writing instruction and assessment they provide. Other questions dealt directly with faculty perceptions of the importance of writing for both the successful completion of the degree program and for the eventual transition of these scientific citizens into post-graduate pursuits. CPS faculty consistently noted the demands of delivering discipline-specific instruction, explaining that experientially-oriented science curriculum dominates what they are able to accomplish within a given course. Faculty indicated that, within the span of a single term (which is 12 weeks at UTM), they typically include written assignments and/or seminar presentations as part of their assessments, but they struggle with offering instruction in writing and/or communication practices alongside their science curriculum. This time-based tension is a familiar problem, and it is an obstacle to effectively integrating science communication into science programs. Yet, both writing *and* science classrooms can be pivotal sites for mobilizing scientific literacies in terms of individual identities, agencies, and larger citizen-making projects.

Despite this clear potential, our work has revealed disconnects between science communication and its terse relationship with professionalization. On one hand, many science students do not necessarily need to be proficient writers to be successful in their degree program. On the other hand, they *do* need to be proficient writers to succeed in whatever type of professional role they may assume after completing their degree. While our colleagues in the sciences consistently display genuine care in offering their students a nuanced education, that attention does not necessarily extend to students' writing-related needs. In many cases, faculty reported that they felt ill-equipped to teach writing skills. This is similar to situations where faculty in the social sciences or humanities may feel unequipped to discuss the nuances of scientific phenomena. This foregrounds a presupposition that is observable in many disciplinary contexts: Faculty are committed to the continuation of their discipline, but not necessarily undergraduate education that leads degree holders to act on their knowledge as professionals or citizens. For graduates of science programs, this is particularly dangerous. The ability to communicate with

public, stakeholder audiences is an essential precondition for naming, contextualizing, and responding to all manner of socioscientific phenomena.

Insofar as teaching science is regarded as a moral obligation and science literacy is regarded as a citizen making project, that work necessarily includes teaching and learning communication practices, infrastructures, and ideologies. The precise “look” of this work will, of course, differ, as all campus cultures have their own assumptions, histories, and curricular centers of gravity. Here at UTM we see faculty suggesting that they cannot carve out space in the science curriculum to make room for additional writing curriculum, which points to another, familiar problem: There appear to be fundamental misunderstandings about writing as a contextual, imperfectible technology. This is to say that our colleagues in the sciences often perceive professional writing, and communication broadly, as simply a technical skill which—once mastered—will transfer across disciplines and audiences (cf. Adler-Kassner and Wardle). While these misconceptions are certainly not exclusive to the sciences, they are, in this context, standing as obstacles to powerful curricular and socioscientific change because they maintain unproductive binaries between the public and the academy, between citizens and scientists, etc.

Accordingly, our research team is exploring some interventions for integrating scientific and communication principles. We draw on our own local campus culture to formulate these suggestions, but we respond to issues found in science programs across contexts. Because of this, we hope these ideas and challenges will resonate more broadly as faculty consider and reconsider how to meaningfully and authentically enable science communication across degree programs.

One option for integrating additional writing curricula in CPS programs would be to take a writing in the disciplines (WID) approach. Because CPS is a multidisciplinary department, this would involve designing a series of WID courses. Stephen Mang, Kate McKnelly, and Michael Morris have, for example, written about their re-design of the course “Writing for Chemists” at University of California, Irvine. A cluster of similar courses within multidisciplinary departments like CPS could create not only a bridge between first-year and disciplinary writing, it could have strong potential for teaching essential public-facing communication strategies through the lens of contemporary scientific issues. If students are not socialized to accept the importance of communicating with stakeholder audiences, they will be unlikely to prioritize that work in their future careers.

All this said, we face what is likely a familiar roadblock to initiating this type of curricular change on our own campus. Some of the CPS programs already require many more credit hours than most other undergraduate programs across the disciplines. This, using the Earth Sciences as an example, stems from accreditation requirements set up by Professional Geoscientists Ontario (PGO), a regulatory organization that governs the practice of professional geoscientists. PGO does offer seminars that teach geoscientists how to communicate scientific information to public audiences, but the organization does not consider communication course work as a part of its accreditation structure. As such, some CPS faculty remain vocally opposed to the addition of any mandatory upper-year, non-discipline courses in their undergraduate programs.

A second option would be to design a series of smaller-scale writing workshops and/or course modules targeting specific genres. For example, faculty in many science pro-

grams teach strategies for field book notetaking or lab report writing; we would advocate expanding this to also teach strategies for communicating complex scientific information to public stakeholders. There has also been discussion of offering “just in time” workshops to support writing activities such as these. There has similarly been discussion of offering one to two week “short courses” in writing for more complex genres. Both types of programming could create opportunities for the use of transdisciplinary pedagogies to cultivate dialogue, offer in-depth formative feedback, and otherwise enact the holistic potential of science communication education.

A third option would be to build a “science writing community” within the department where undergraduate students, graduate students, and faculty could come together on a regular basis to discuss writing. These would take the format of weekly brown bag lunches where active sharing of writing, at various stages, was encouraged. CPS faculty have suggested that this approach would productively normalize the fact that writing—for any audience—is hard. Inviting students to witness the challenges faced by experienced science writers could normalize the fact that writing is a contextual process that allows scientists to respond to social needs.

Science education often takes place with the expectation that undergraduates will pursue postgraduate study. Yet, most students—at least at UTM—do not. Rather, they tend to find industry, non-profit, lab-based, or government work. This suggests that the primary purpose of science education is not the perpetuation of disciplines, and we are working to foreground the fact that disciplinary writing is a process of joining a community. It is a process of grasping its language, history, concerns, and knowledge production. It is a process of becoming an ambassador from that community: communicating with diverse public audiences in ways that account for their needs, values, experiences, and presuppositions.

Writing initiatives for science students must prepare them to communicate *about* science, to make their knowledge understood more broadly by non-expert audiences in a science-driven society. By understanding their disciplinary community, students build actionable tools for embracing the obligation to be strong communicators of science as part of their professional growth and citizenship in such a society.

Works Cited

- Adler-Kassner, Linda and Elizabeth Wardle. “Naming What We Know. The Project of this Book” *Naming What We Know. Threshold Concepts of Writing Studies*, edited by Linda Adler-Kassner & Elizabeth Wardle, Utah State University Press, 2015, pp. 1-14.
- Downs, Douglas, and Elizabeth Wardle. “Teaching About Writing, Righting Misconceptions: (Re)envisioning ‘First-Year Composition’ as ‘Introduction to Writing Studies.’” *College Composition and Communication*, vol. 58, no. 4, 2007, pp. 552–84.
- Mang, Stephen, Kate J. McKnelly, and Michael Morris. “Redesigning a “Writing for Chemists” Course Using Specifications Grading” *ChemRxiv*, 2020.