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COMMUNICATING SCIENCE SPECIAL ISSUE

Rethinking Science Communication: The Need for Dialogic, Transdisciplinary Collaboration

Julia E. Kiernan

Many moons ago, I was an undergraduate student *and* a dual major—pursuing degrees in both the sciences and the humanities. At the time, I knew my chosen path was uncommon, but I didn't actually realize the extent to which my learning deviated from peers (who had chosen either sciences or humanities). Upon reaching graduate school I shifted my educational focus exclusively to the humanities and didn't really look back; until my professional career began: I joined an interdisciplinary liberal arts department (in a STEM institution) and began teaching humanities courses to almost exclusively science students. It was not until this moment that I came to understand how my undergraduate experience, which was varied, diverse, and distinctly interdisciplinary, put me at an advantage not just academically, but as a social being who existed in a world outside the university. Moreover, as I began teaching science communication courses, inviting students to try on different communicative strategies—traditional text-based, as well as new genres and new media—I realized that to be an effective science communicator one needed to communicate not simply in multiple spaces, but to listen carefully, thoughtfully, and intentionally in these spaces. It is this listening that I think is at the heart of this special issue. And not just listening within the classroom (although this is incredibly important!), but outside the classroom—on the street, the bus, social media, and all the places in between.

Thus, this special issue emerged in response to what I saw as a lack of attention to science communication in STEM-focused institutions, and not just science communication, but dialogic and transdisciplinary-informed science communication. For many of us who teach English, writing, and other language-specific courses in higher education settings, there is often a reluctance among colleagues to engage with STEM-focused topics and themes in non-STEM courses—resulting in coursework that is rigidly discrete. This resistance is understandable given the often marginalized position of language education in STEM institutions; however, this approach, which is marked by disciplinarity, is a disservice to science students who will leave our classrooms and enter professions where they are required, but often ill-equipped, to engage with myriad public audiences.

Understanding the various implications of this disconnect requires us to rethink post-secondary approaches to teaching science communication. We can teach students the importance of communicating with both peers *and* non-peers; this is needed to excel within not just the classroom, but outside of it as well. Such attention to science communication and public outreach must happen not just in Writing-in-the-Disciplines (WID) courses but across the entire educational experience via the implementation of focused and thorough Writing-Across-the-Curriculum (WAC) initiatives. The authors in this special issue describe a number of pedagogical and programmatic interventions that can respond to this gap in student ability, which include attention to collaboration

across disciplines as well as skillsets that enable students to communicate effectively across shifting public discourse communities.

As these essays show, there is a clear need for faculty who teach science communication in writing and other language-oriented courses to invite students to consider the transdisciplinary nature of these communicative interactions. Situating science communication within a single discipline is short-sighted; however, we must also understand why science communication must be more than interdisciplinary. And, while interdisciplinary learning is certainly important within academic spaces that teach the tenets of science communication, it cannot be the end point. Transdisciplinary approaches are integral because they exist beyond the classroom, bridging academic and public life by valuing and engaging with the outside world—a world that is full of values and perspectives that often deviate from those within the classroom. Underprepared science students moving into professional spaces exacerbate the disconnects between scientists and citizens, which results in vast chasms of misunderstanding and skepticism. The current pandemic is evidence of this divide. Now, in 2023, I am regularly struck by the dystopian nature of public attitudes that rebuff science: swaths of people who wholeheartedly believe that the Covid-19 pandemic is not real, that vaccines are filled with tracking devices (or crushed up human embryos), or that drinking bleach and other disinfectants is a form of treatment. Yet, to many citizens, compliance with science is itself a dystopian stance. As examined in a number of the essays herein, such division is evident across various facets of science; this is particularly noteworthy in environmental and climate science, where (unlike the current pandemic) scientists have been attempting to communicate to the public for decades rather than years. These realities are frightening and, one may argue, a clear indication that contemporary science communication education is not effective. At the same time, the opposite could also be argued; some modes of science communication have been incredibly effective. Take, for instance, the ways that large (trusted) international corporations—ExxonMobil, Volkswagen, Johnson & Johnson, etc.—have worked with company scientists to manipulate scientific information for economic gains that result in social calamity—climate pledges, diesel dupes, and cancer epidemics. There is clearly an ethical dimension inherent in any teaching of science communication, yet when we train students in disciplinary silos learners are often unaware of the socioscientific nature of their future professions. This is an educational failure. As teachers, administrators, and program directors, we need to embrace an approach that values the synergistic nature of socioscientific pedagogies; their ability to “facilitat[e] scientific reasoning and sociocultural development” (Zeidler 20).

In these ways, this special issue’s attention to broadening pedagogical and methodological approaches to science communication aims to expand perspectives on the ways scientific language functions differently across shifting situations. It takes this stance so that, as practitioners, we are prepared to expand students’ repertoire of science communication and, in turn, students are prepared to proactively engage with a growing public that has and continues to lose trust in science. As indicated in many of the included essays, we can no longer relegate science communication to only science courses (or only first-year-composition courses); we need to come together across disciplines to solve this dangerous communicative dilemma. Solving requires not simply understanding, but meeting these issues head on and designing strategies that are usable and replicable

across shifting contexts and audiences. This special issue is one attempt to embolden this sea change and includes approaches that are familiar—narrative and narratology, blended learning, student agency, etc.—but also those that are not as widely adopted across the curriculum. Many contributors come from English and writing studies, but others come from spaces throughout the university—libraries, interdisciplinary institutes, medical schools, and science programs. In these ways, interdisciplinarity takes shape, but the focus of these essays is expanding these conversations into transdisciplinary spaces. The approaches described herein situate science communication as a holistic endeavor, one that is shaped by many disciplines and voices. In these ways, this special issue invites readers to imagine new ways of promoting science communication across the curriculum and extend our discussions beyond traditional disciplinary and interdisciplinary learning spaces.

In addition to the full-length articles that address the aforementioned issues, this special issue includes two *Connecting Essays*, which are offered as complements to each other. The first positions WAC as a pedagogical solution to building scientific literacy; the second echoes this positioning, extending this argument to academic responsibility. What is interesting about each is not simply the shared attention to harnessing scientific knowledge, science literacy, and citizen-science, but also the ways that both sets of collaborators are clear in their articulation of why such pedagogical moves matter to scientific disciplines, yes, but also society at large. Both groups of collaborators, like the other contributors, note that these efforts must be collaborative and transdisciplinary—arguing that humanities and science programs need to work together to rectify this knowledge gap. However, even though both pieces offer clear pathways forward, Gerstle et al. providing a series of interventions and Carrion et al. offering a replicable programmatic approach, my apprehension is that without buy-in from those who teach science—without the support of science programs and administrators—we cannot change the current status quo.

The teaching of science communication is a transdisciplinary task and cannot be driven (or expected to be driven) by a single college, department, or school. Teaching students to be scientifically literate must be realized as important across all facets of education and, as Carrion et al. explain, be sustained and sustainable. Of course, as Gerstle et al. describe, the primary barrier to this intervention is time. And, because undergraduate science education has not traditionally valued science communication—communication being a humanities construct, not framed by hard science—this area of science education continues to be neglected. This negligence, as outlined in my opening vignette and subsequent examples, is—to quote Gerstle et al.—“dangerous.” Dangerous for students and dangerous for citizens. It is dangerous to separate the science from the social, positioning both as discrete entities, because this is not how broader society lives. As citizens our lives are embroiled in *socioscientific* experiences. Accordingly, what the many examples of science communication gone awry offered throughout this special issue point to is a needed rethinking and reimagining of post-secondary education’s approach to teaching scientific education. As both *Connecting Essays* illustrate, our current siloed, disciplinary approach to teaching science students is—as Carrion et al. explain—isolat-

ing *and* dangerous. Instead, we need to structure our teaching of science communication via a transdisciplinary lens that is not simply collaborative, but also socially responsible.

Fortuitously, this special issue offers replicable solutions to this gap. Yet, as educators and administrators we need to swallow hard, ignore the moans of complaint amongst (some of) our colleagues, and carve out time and space for a new type of science education: one that is framed not simply by scientific knowledge, but also science literacy and science citizenship. As both *Connecting Essays* argue, to be effective and confident professionals, science students need to engage in layered and scaffolded approaches *across the curriculum*—learning takes time and we need to make that time. The learning of science communication must be designed as a meaningful, lasting, and responsive experience that takes place (to varying degrees) in all the required courses that science students take; this means that we need to value a synergistic, socioscientific approach that is collaborative and transdisciplinary.

Work Cited

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