Marisa Brandt Teaching Philosophy

"Scientific practice is above all a story-telling practice." – Donna Haraway, 1989
"It matters what stories make worlds, what worlds make stories." – Donna Haraway, 2013[1]

I am fascinated by stories and their power to help us imagine worlds. Following feminist science studies scholar, Donna Haraway, I see the construction of stories—especially those about science and technology—as a site of ethical engagement. What stories are told to convince us of the good a new technology will bring our lives, or lead us to fear monsters? What stories help us understand how scientists make knowledge, and who might be marginalized in the process? In my position as a professor in the History, Philosophy, and Sociology of STEM at Lyman Briggs College, I have the privilege of working with undergraduate STEM students destined for careers in which they will be responsible for making, applying, and communicating scientific knowledge. As a teacher-scholar focused on both the effects of technoscience on culture and the cultures of technoscientific fields, my primary goal in this role is to develop expertise in technoscientific stories: how to tell them in ways that will capture my audience's interest imagination, how to understand and interpret them in their relevant cultural and historical contexts, and how to help those learning to become responsible users and communicators of technoscientific knowledge to do the same.

To this end, I draw upon my professional training in two interdisciplinary fields: science and technology studies and communication and media studies. Communication and media studies takes as its primary object of interest the ways that meanings are made and circulate in cultural contexts. Science and technology studies, in turn, investigates how social and political contexts shape and are shaped by the production of scientific knowledge and practices of innovation. Taken together, I use the insights of these fields to create courses and support research that investigate how scientific knowledge and innovations are not only made, but made meaningful to diverse audiences through the stories told about them.

Additionally, I subscribe to the tenants of 21st century education, as described by scholars like Cathy Davidson, and Bernie Trilling and Charles Fadel.[2] According to these higher education researchers, key skills to cultivate in 21st century students include creativity, critical thinking, communication, and collaboration, as well as the capacity to learn how to learn, especially using the Internet and other digital tools. I see my students as "cyborgs," beings shaped by their connections to an ever-expanding network of digital technologies. I aim to help them to not only learn *about* technology and media, but to use my courses as an infrastructure in which to develop new mediated communication skills that they can use to tell their own stories.

In order to advance these goals as an instructor at Lyman Briggs College, I have pursued three primary sets of activities: 1) developing and re-developing courses to complement STEM majors' educations and adjusting my teaching techniques to them; 2) expanding my skillset in media production pedagogy through relationships with instructional resources on and off campus; and 3) training undergraduates in social science research methods, both individually and in collaboration. I will address these below.

Since joining LBC, I have developed and taught eight unique courses that bring together my interest and expertise in the relationship between science, technology, and culture:

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[1] Haraway, D. (1989) Primate Visions: Gender, Race, and Nature in the World of Modern Science. New York: Routledge; Haraway, D. (2013). SF: Science Fiction, Speculative Fabulation, String Figures, So Far. *Ada: A Journal of Gender, New Media, and Technology, No.3.* doi:10.7264/N3KH0K81

[2] Davidson, C. (2017) The New Education: How to Revolutionize the University and Prepare Students for a World in Flux. NY: Basic Books. Trilling, B. & C. Fadel (2011) Twenty First Century Skills: Learning for Life in Our Times. NY: John Wiley and Sons.

- LB 133 Intro to HPS - Science & Culture: The Social Life of Facts
- LB 322B – Technology, Culture, and Society
- LB 336/324B - Issues of Representation in Gender, Sexuality, Science, and Technology
- LB 331 - Cyborgs and Science Fiction
- LB 333 - Gender & Diversity in the History of Science
- And three LB 492 Senior Seminar topics:
    - Simulations & Gaming
    - Media, Knowledge, & Power
    - Cyborg Ethics

While the specific topics of these courses are diverse, I designed each with the common interest in making students into smarter, more ethical, and more responsible makers and consumers of technoscientific culture. I do this in the courses by developing students' critical science literacy,[3] which entails helping them to both read and experiment with finding new ways to tell stories about technoscience. I have found that teaching critique alone is unsatisfactory to student learning: if I'm going to challenge them to question their worlds and the stories they have accepted all their lives, then I have an ethical responsibility as an educator to give them tools to make better ones. Therefore, I have been continually seeking opportunities to learn new ways to teach students in my classes not only how to understand and interpret cultural texts like video games, science fiction, and Wikipedia articles, but also how to use them to tell stories of their own.

About one third of my teaching each year takes place in a course called LB 133. This class presents a unique challenge, as both an Introduction to History, Philosophy, and Sociology of Science, Technology, the Environment, and Medicine, as well as the students' first-year writing course. My approach to this course centers on developing communication skills through inquiry-based, largely collaborative projects that ask students to find answers to five fundamental questions about the relationship between science and culture: *What is the value of science education? Who are scientists? How do they produce knowledge? How does scientific knowledge circulate? And why is scientific knowledge contested?* I chose these questions because one of the important learning outcomes for first-year writing courses is to help students "understand the relationships among language, knowledge, and power."[4] The projects students conduct in order to answer these questions concern fundamental issues of scientific knowledge and power in society. I intend them to empower students to become responsible and empathetic science communicators. The projects for the course are arranged in a sequence designed to scaffold the development of the writing skills outlined in the Writing Pedagogy Association Guidelines for first year writing over the course of the semester. We begin with exploring writing and reading as tools for inquiry, learning, thinking, and communicating. Their first assignment entails composing an argument based on their experience. From there, they conduct collaborative research projects that incorporate additional skills in learning how to "integrate their own ideas with those of others" as well as "finding, evaluating, and analyzing, and synthesizing appropriate primary and secondary sources."[5]

Over the past five years, I have tinkered with this structure iteratively, working to find ways to motivate my students to think and write critically about these questions. During the 2018-2019 academic year, I introduced a major innovation: the creation of a weekly "Curiosity Colloquium." I invite speakers to talk to the students about what they are curious about and how they became curious about it. I have several overlapping goals for this colloquium. The first is to expose the students to a range of professionals who bring together science and culture in their work. I want the students to see that the ideas about both communication skills and science's role in society that we are discussing are not

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[3] Giordano, S. (2017). Those who can't, teach: critical science literacy as a queer science of failure. *Catalyst: Feminism, Theory, Technoscience*, *3*(1), 1-21

[4] WPA Outcomes Statement for First-Year Composition. http://wpacouncil.org/positions/outcomes.html

[5] Ibid.

abstract, but rather features of contemporary life for a wide range of professionals. Given that the majority of our students come to Briggs at pre-meds, but less than half end up applying to medical school, I also want to give them a broad view of kinds of scientific professions that they may pursue. I ask presenters to consider their work in terms of curiosity, because I want them to model the way that both knowledge and careers unfold through a process of interest and engagement with the world—rather than by following a clear path. To this end, we ask presenters to also address *how* they became curious about their research, which is often a journey with many unexpected turns. Students, in turn, are asked to write minute-responses to the presentations and then ask questions to the presenter. For many students, this is their first time attending scholarly presentations and my aim is to provide an experience that will inoculate them against the fear of asking questions in a large group, thereby helping them to become more engaged members of not only our college, but the technoscientific civil society in which we live.

At the 300-level, students are acculturated into Briggs, meaning that they expect inquiry-based learning, group work, and discussions to be central to their learning. In these courses, I provide less structure, turning over more of the course to students and their own interests. I currently teach two courses at the 300-level, LB 322B and LB 324B. Both courses make three basic moves. First, we learn skills in cultural analysis, usually grounded in analyzing how discourses about the topic at hand are constructed through media and in everyday life. Given the social science perspective of the course, this first move is useful for helping students to confront the origins of their current assumptions about culture and society, which in turn helps open them up to acknowledging the limits of their existing knowledge. This unit culminates in an artifact analysis. Then, we turn to more traditional social science case studies that illustrate the differential effects of power (be it that of gender and/or technology) on societal stakeholders. I evaluate learning in this unit through a short research paper that asks the student to examine and synthesize scholarly social science literature on how an issue affects real people. Finally, we conclude with methods for imagining the world otherwise and examine strategies for empowerment and social justice. Their final projects are small-group research projects that ask them to synthesize these forms of learning. For example, they might research popular images of a technology and contrast these against the social science literature on the known affects it has had in the lives of people. Or they might create a piece of speculative fiction, drawing on research about how a technology is current developing and who is affected by this change. Throughout the course, I work to decenter myself as instructor. Half of all classes are student led, usually in pairs or small teams, based on a highly structured format I give them that entails leading a discussion of the reading, offering small case studies that further illustrate the points of the reading, and culminating in a collective learning activity. Additionally, students keep weekly reflective journals to chart their developing ideas, which they submit prior to class. This allows me to draw on their comments and questions as I prepare for the classes when I lead.

At the senior level, I see the 492 capstone course as an opportunity help the student complete their education as an independent learner. A course that I designed and taught in Spring 2017, LB 492: Cyborgs! illustrates this approach. This course encourages students to consider the ethical issues and cultural conundrums that face society as our everyday lives become increasingly entangled with ever-more sophisticated information technologies. To this end, I introduce *cyborgs* as a theoretical framework for approaching these issues, followed by three topics that illustrate them: smartphones, prosthetics, and virtual reality. To place students at the helm of our discussion of these topics, I employ a teaching strategy I designed to foster analytic thinking and participation using thematic Google Slide decks. For each set of readings, I create and share a slide deck that prompts the students to find examples of the readings' object of study and analyze it using course concepts. We then use this deck in class to give everyone a chance to share their example and use it to raise questions about issue at hand. For example, I paired readings on the impact of patient experiences of prosthetic technologies on their gender identity with a deck called "Being Cyborgs." For this deck, students found examples of people telling their stories of using prosthetics, wrote about the role of gender in their self-presentation, and prepared discussion questions. Since my 492 readings are often more challenging and theoretical than in the earlier years, I find that giving students the opportunity to come up with their own examples of the phenomena we discuss in class helps them to

engage more deeply with the ideas, and see them as concrete and relevant to their own lives, rather than abstract and academic. (An example deck is in the Appendix.)

Other aspects of the course also highlight my student-centered approach to learning. After consulting with colleagues, one teaching innovation I tried for the first time in that course was having teams of students each design and lead one week of the course after Spring Break. You can see the topics they selected in the attached syllabus. Each student also explored a "cyborg" technology of interest to own their future through a final research product using digital technology that they have never attempted before. My goal here was not only for each of these graduating seniors to create capstone research projects for their degrees, but also to show them that they have the power to teach themselves new technological skills.[6] Their projects were phenomenal, and included a blog documenting the 3-D printing of a heart, a documentary on mental health technology, and *Black Mirror*-esque short stories on electronic medical records (included in Assessments). My media-creation approach has also given me the opportunity to extend my own campus network of technology resources, for example, I organized a fieldtrip to the library's Digital Scholarship Lab to try virtual reality and learn about production tools, which in turn led to me being invited to sit on the DSL's first advisory board.

A third important area of innovation in my teaching has been to incorporate projects that utilize social science research methods. Most of my students are natural science majors with an interest in medical, biomedical research, or environmental research professions. It is valuable for these students to develop both an awareness of social science as a set of tools and ideas that can advance their understanding of issues they may encounter in their professions, so I work to teach them how to evaluate the knowledge claims advanced in diverse social science literature. To this end, I have been developing course projects that incorporate content analysis, discourse analysis, and ethnography. Going forward, I want to develop more productive ways to use polling and surveys in my courses to foster conversation. One small and powerful example of this comes from my efforts to lead productive discussions of sexual harassment in science in my course on science and gender, LB 324B. In the past, I have found that students who have never experienced gendered aggression often laugh off the issue in disbelief and discomfort. This makes it difficult to discuss. Now I survey them: "How many of you received pepper spray as a gift when you left for college?" "How many of you received beer and/or condoms?" Starting from a place of curiosity, we are able to have much more productive conversations about the gendered experience of academic life.

My students frequently comment that I convey an enthusiasm for the course material and a genuine interest in them and their learning, both through how I interact with them and in how I design the material and assignments. I often feel that I ask a lot of my students, but SALG comments like "A lot of work, but it mattered," show me that they find this work meaningful.

I am ever on the lookout for new ways to find, share, analyze, and teach students how to create meaningful stories about science...ones that help them to understand its role in the world, and ones that help them to imagine and even create a better one.

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[6] This is also the preferred and most effective way for students to learn multi-media communication tools: See, e.g. Cooper, Marilyn (2007) "Chapter 13: Learning Digital Literacies." From *Multimodal Composition: Resources for Teachers.* (ed. C.L. Selfe). Cresskill, New Jersey : Hampton Press, Inc.