How to engage students in required HPS courses, Part II: The "usefulness" of HPS

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Student disconnection and disengagement pose one of the most serious challenges we face as teachers. The student who stays mostly silent in class discussions and contributes little to group work. The student who attends intermittently, hands in assignments sporadically, and by the end of the semester disappears entirely. The student who skips online lectures and ghosts you on email. The student who requests an emergency extension on the final project but never hands anything in. How can we design courses to reduce the likelihood of these scenarios and intervene when students do drift away from our courses?

We both teach courses that explore science from the perspectives of the humanities and the social science in Michigan State University's science-focused Lyman Briggs College. Rich also teaches a large enrollment general-education class on biology, technology, and the human condition, which fulfills a university requirement in the arts and humanities. Many of our students treated our classes as a hoop they had to jump through on their way to a credential, and not as something relevant to their futures. Even before the spring of 2020, others faced personal or academic stressors which impeded their educational progress. The COVID-19 pandemic has dramatically exacerbated the pressures on students.

We've found strategies to reduce student disengagement that we hope will be useful to our CSHPS colleagues who teach similar "service" or "Gen. Ed." courses to non-HPS majors. Our strategies are grounded in two broad principles. First, we strive to create a culture of care, which we explained in part 1 of this article in the previous issue of Communiqué (p.28-30). Second, we unequivocally advocate for the "usefulness" of our courses, which we discuss here.

The "usefulness" of HPS

Students reasonably want to know how a course will be *useful* to them. Often, they define "useful" in unhelpfully narrow terms: will I need to know this piece of knowledge to do the job I aspire to have? We can help rescue students from this suffocating view by designing classes that place little weight on memorization and rote compliance with rules.

Albert Einstein scoffed at the notion that he would bother to memorize something like the speed of sound, which he could easily look up in a book if needed. "The value of a college education is not the learning of many facts," he said, "but the training of the mind to think." What does this training look like? Charles Darwin provides a

concise model. At the end of his life, he advised the young scientist "to observe for himself, giving full play to his imagination, but rigidly checking it by testing each notion experimentally." We need to create a course structure that allows students to combine curiosity and rigour—and let them know that that's what we're doing.

Part of this foregrounding involves explaining explicitly that knowledge doesn't have to have an immediate instrumental use to be valuable. How many jobs require *direct* knowledge of, say, the history of science in World War II? Not many! Someone can be a productive scientist and an informed, responsible citizen without ever hearing about Vannevar Bush and the Office of Scientific Research and Development. It *is* useful, however, to understand the complexities and contingencies of organizing and funding scientific research. Bush's leadership of American war research and his postwar advocacy for a particular vision of public-supported basic science provides a dramatic case study in the complex evolution of government science policy. There's of course an indefinite number of other case studies which illustrate the relevance of HPS to a wide range of civic issues. By explicitly addressing this relevance, instructors can combat the common view of history as a series of factoids to memorize (and then forget) and towards the ideal articulated by G.R. Elton (telling echoing Darwin): history as "imagination, controlled by learning and scholarship, learning and scholarship rendered meaningful by imagination.

When teaching non-HPS majors, instructors should always remember that HPS primary and secondary sources can be intimidating to nonspecialists. There are two complementary approaches to solve this problem. First, aim to assign accessible material. There's an abundance of writing, documentaries, and podcasts on HPS topics for a general audience. Start there. This isn't "dumbing down" since, say, the readers of the *New Yorker* aren't dumb; they aren't subject experts and neither are our undergrads. Second, when you do assign writing for specialized audiences, make sure the students understand that it's *natural* that they struggle to read something that isn't written for people like them. Approach the reading as an outsider and explicitly include them in the adventure of engaging work that in its alienness otherwise can feel exclusionary.

Final words

Many situations aren't covered by these tips, but by centering students' needs in your pedagogy and scaffolding their experience, you have a better chance that they can thrive and learn in your course.

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