Crisis. Reform. Repeat.

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If you have been involved in higher education in recent decades, you have noticed shifts in how courses are conceived and delivered, and what students, teachers, and administrators expect of each other. Also, water feels wet. The latter statement offers as much insight as the first. When authors argue the need for new academic models, indeed that a kind of crisis in United States higher education is occurring, faculty and administrators in higher education are forgiven if we give a yawning reply: not much insight there.

Another Crisis

Those with far more experience in academia than I will, likely, shake their heads and scoff: demands for shifts in educational models and practices seemingly occur every few years. Not long ago, I was part of the SERRC Collective Judgment Forum (2013) debating the notion that Massive Open Online Courses (MOOCs) are the future of higher education. The possibilities and challenges portended by online education would disrupt ("disruptive technologies" often represent the *goals* not the *fears* of the California culture where I live and work) the landscape of colleges and universities in the United States and the rest of the world.

Higher education would have to adapt to meet the needs of burgeoning numbers of people (at what point does one become a 'student?') seeking knowledge. The system of higher education faced a crisis; the thousands of people enrolling in MOOCs indicated that hordes of students might abandon traditional universities and embrace new styles of learning that matched the demands of twenty-first century life.

Can you count the number of professional crises you have lived through? If the humanities and/or social sciences are your home, then you likely remember quite a few (Kalin, 2017; Mandler, 2015; Tworek, 2013). That number, of course, represents calamity on a local level: crises that affect you, that loom over your future employment. For many academics, MOOCs felt like just such a threat.

Historian of technology Thomas Hughes (1994)[i] describes patterns in the development, change, and emergence of technologies as "technological momentum." Technological momentum bridges two expansive and nuanced theories of technological development: determinism—the claim that technologies are the crucial drivers of culture—and constructivism—the idea that cultures drive technological change. MOOCs might motivate change in higher education, but the demands of relevant social groups (Pinch and Bijker 1984) would alter MOOCs, too.

Professors ought not fear their jobs would disappear or consolidate so precipitously that the profession itself would be transformed in a few years or decade: the mammoth system of higher education in the U.S. has its own inertia. Change would happen over time; teachers, students, and universities would adapt and exert counter-influences. Water feels wet.

MOOCs have not revolutionized models of higher education in the United States. Behind the eagerness for models of learning that will satisfy increasing numbers of people seeking higher education, of which MOOCs are one example, lies a growing concern about how higher education is organized, practiced, and evaluated. To understand the changes that higher education seems to require, we ought first to understand what it currently offers. Cathy Davidson (2017), as well as Michal Crow and William Dabars (2015), offer such histories of college and university systems in the United States. Their works demonstrate that a crisis in higher education does not approach; it has arrived.

Education in an Age of Flux

I teach at a new college in a university that opened its doors only a decade ago. One might expect that a new college offers boundless opportunity to address a crisis: create a program of study and methods of evaluating that program (including the students and faculty) that will meet the needs of the twenty-first century world. Situated as we are in northern California, and with faculty trained at Research 1 (R1) institutions, our college could draw from various models of traditional higher education like the University of California system or even private institutions (as we are) like Stanford.

These institutions set lofty standards, but do they represent the kinds of institutions that we ought to emulate? Research by Davidson (2017), Crow and Dabars would recommend we not follow the well-worn paths that established universities (those in existence for at least a few decades) in the United States have trodden. The authors seem to adopt the perspective that higher education functions like a system of technology (Hughes 1994); the momentum exerted by such systems has determining effects, but the possibility of directing the course of the systems exists nevertheless.

Michael Crow and William Dabars (2015) propose a design for reshaping U.S. universities that does not require the total abandonment of current models. The impetus for the needed transformation, they claim, is that the foundations of higher education in the U.S. have decayed; universities cannot meet the demands of the era.

The priorities that once drove research institutions have been assiduously copied, like so much assessment based on memorization and regurgitation that teachers of undergraduates might recognize, that their legibility and efficacy have faded. Crow and Dabars target elite, private institutions like Dartmouth and Harvard as exemplars of higher education that cannot, under their current alignment, meet the needs of twenty-first century students. Concerned as they are with egalitarianism, the authors note that public institutions of higher education born from the Morrill Acts of 1862 and 1890 fare no better at providing for the needs of the nation's people (National Research Council 1995).

Crow and Dabars's New American University model (2015, pp. 6-8) emphasizes access, discovery, inclusiveness, and functionality. Education ought to be available to all (access and inclusiveness) that seek knowledge and understanding of the world (discovery) in order to operate within, change, and/or improve it (functionality). The Morrill Acts, on a charitable

reading, represent the United States of America's assertion that the country and its people would mutually benefit from public education available to large swaths of the population.

Crow and Dabars, as well as Davidson (2017), base their interventions on an ostensibly similar claim: more people need better access to resources that will foster intellectual development and permit them to lead more productive lives. The nation benefits when individuals have stimulating engagement with ideas through competent instruction. Individuals benefit because they may pursue their own goals that, in turn, will ideally benefit the nation.

Arizona State University epitomizes the New American University model. ASU enrolls over 70,000 students—many in online programs—and prides itself on the numbers of students it accepts rather than rejects (compare such a stance with Ivy League schools in the U.S.A.). Crow, President of ASU since 2002, has fostered an interdisciplinary approach to higher education at the university. Numerous institutes and centers (well over 50) have been created to focus student learning on issues/topics of present and future concern. For instance, the Decision Center for a Desert City asks students to imagine a future Phoenix, Arizona, with no, or incredibly limited, access to fresh water.

To engage with a topic that impacts manifold aspects of cities and citizens, solutions will require perspectives from work in disciplines ranging from engineering and the physical sciences to the social sciences and the humanities. The traditional colleges of, e.g., Engineering, Law, Arts and Sciences, etc., still exist at ASU. However, the institutes and centers appear as semi-autonomous empires with faculty from multiple disciplines, and often with interdisciplinary training themselves, leading students to investigate causes of and solutions to existing and emerging problems.

ASU aims to educate broad sections of the population, not just those with imposing standardized tests scores and impressive high school GPAs, to tackle obstacles facing our country and our world. Science and Technology Studies, an interdisciplinary program with scholars that Crow and Dabars frequently cite in their text, attracted my interest because its practitioners embrace 'messy' problems that require input from, just to name a few, historians, philosophers, political scientists, and sociologists. While a graduate student in STS, I struggled to explain my program of study to others without referencing existing disciplines like philosophy, history, etc. Though I studied in an interdisciplinary program, I still conceptualized education in disciplinary silos.

As ASU graduates more students, and attracts more interdisciplinary scholars as teachers, we ought to observe how their experiment in education impacts the issues and problems their centers and institutes investigate as well as the students themselves. If students learn from interdisciplinary educators, alongside other students that have not be trained exclusively in the theories and practices of, say, the physical sciences or humanities and social sciences, then they might not see difficult challenges like mental illness in the homeless population of major U.S. cities as concerns to be addressed mainly by psychology, pharmacology, and/or sociology.

Cathy Davidson's *The New Education* offers specific illustrations of pedagogical practices that mesh well with Crow and Dabars's message. Both texts urge universities to include larger numbers of students in research and design, particularly students that do not envision themselves in fields like engineering and the physical sciences. Elite, small universities like Duke, where Davidson previously taught, will struggle to scale up to educate the masses of students that seek higher education, even if they desired to do so.

Further, the kinds of students these institutions attract do not represent the majority of people seeking to further their education beyond the high school level. All colleges and universities need not admit every applicant to align with the models presented by Davidson, Crow and Dabars, but they must commit to interdisciplinary approaches. As a scholar with degrees in Science and Technology Studies, I am an eager acolyte: I buy into the interdisciplinary model of education, and I am part of a college that seeks to implement some version of that model.

Questioning the Wisdom of Tradition

> We assume that our institutions have been optimally structured and inherently calibrated not only to facilitate the production and diffusion of knowledge but also to seek knowledge with purpose and link useful knowledge with action for the common good. (Crow and Dabars 2015, 179)

The institutions that Crow, Dabars, and Davidson critique as emblematic of traditional models of higher education have histories that range from decades to centuries. As faculty at a college of health sciences established the same year Crow and Dabars published their work, I am both excited by their proposals and frustrated by the attempts to implement them. My college currently focuses on preparing students for careers in the health sciences, particularly medicine and pharmacy. Most of our faculty are early-career professionals; we come to the college with memories of how departments were organized at our previous institutions.

Because of my background in an interdisciplinary graduate program at Virginia Tech, and my interest in the program's history (originally organized as the Center for the Study of Science in Society), I had the chance to interview professors that worked to develop the structures that would "facilitate the production and diffusion of knowledge" (Crow and Dabars 2015, 179). Like those early professors at Virginia Tech, our current faculty at California Northstate University College of Health Sciences come from distinct disciplines and have limited experience with the challenges of designing and implementing interdisciplinary coursework. We endeavor to foster collaboration across disciplines, but we learn as we go.

Crow and Dabars's chapter "Designing Knowledge Enterprises" reminds one of what a new institution lacks: momentum. At meetings spread out over nearly a year, our faculty discussed and debated the nuances of a promotion and retention policy that acknowledges the contributions of all faculty while satisfying administrative demands that faculty titles, like

assistant, associate, and full professor, reflect the practices of other institutions. What markers indicate that a scholar has achieved the level of, say, associate professor?

Originally trained in disciplines like biology, chemistry, physics, or English (coming from the interdisciplinary program of Science and Technology Studies, I am a bit of an outlier) our faculty have been disciplined to think in terms of our own areas of study. We have been trained to advance knowledge in increasingly particular specialties. The criteria to determine a faculty member's level largely matches what other institutions have developed. Although the faculty endeavored to create a holistic rubric for faculty evaluation, we confronted an administration more familiar with analytic rubrics. How can a university committee compare the work done by professors of genetics and composition?[ii]

Without institutional memory to guide us, the policies and directives at my college of health sciences develop through collective deliberation on the needs of our students, staff, faculty, college, and community. We do not *invent* policy. We examine publicly available policies created at and for other institutions of higher learning to help guide our own decisions and proposals. Though we can glean much from elite private institutions, as described by Crow and Dabars, and from celebrated public institutions like the University of California or California State University systems that Davidson draws upon at times in her text, my colleagues know that we are not like those other institutions and systems of higher education.

Our college's diminutive size (faculty, staff, and students) lends itself to agility: when a policy is flawed, we can quickly recognize a problem and adjust it (not to say we rectify it, but we move in the direction of doing so, e.g., a promotion policy with criteria appropriate for faculty, and administrators, from any department). If we identify student, staff, faculty, or administrator needs that have gone unaddressed, we modify or add policies.

The size of our college certainly limits what we can do: we lack the faculty and student numbers to engage in as many projects as we like. We do not have access to the financial reservoirs of large or long-standing institutions to purchase all the equipment one finds at a University of California campus, so we must be creative and make use of what materials we do possess or can purchase.

What our college lacks, somewhat counterintuitively, sets us up to carry forth with what Davidson (2017) describes in her chapter "The Future of Learning:"

> The lecture is broken, so we must think of better ways to incorporate active learning into the classroom . . . . The traditional professional and apprentice models don't teach students how to be experts, and so we must look to peer learning and peer mentoring, rich cocurricular experiences, and research to put the student, not the professor or the institution, at the center. (248-9)

Davidson does not contend that lecture has no place in a classroom. She champion flipped classrooms (Armbruster, Patel, Johnson, and Weiss 2009) and learning spaces that

emphasize active student engagement (Elby 2001; Johnson and Johnson 1999) with ideas and concepts—e.g., forming and critiquing arguments (Kuhn 2010).

Claiming that universities "must prepare our students for their epic journey . . . . should give them agency . . . to push back [against the world] and not merely adapt to it" (Davidson 2017, 13) sounds simultaneously like fodder for a press-release and a call to action. It will likely strike educators, a particular audience of Davidson's text, as obvious, but that should not detract from its intentions. Yes, students need to learn to adapt and be flexible—their chosen professions will almost certainly transform in the coming decades. College students ought to consider the kinds of lives they want to live and the people they want to be, not just the kinds of professions they wish to pursue.

Ought we demonstrate for students that the university symbolizes a locale to cultivate a perspective of "sympathy, empathy, sensitivity, and responsiveness" (Held 2011, p. 479)? Do we see ourselves in a symbiotic world (Margulis and Sagan) or an adversarial world of competition? Davidson, Crow, and Dabars propose a narrative of connectivity, not just of academic disciplines, but of everyday problems and concerns. Professors ought to continue advancing knowledge, even in particular disciplines, but we must not imagine that we do it alone (individually, in teams, in disciplines, or even in institutions).

After Sifting: What to Keep

Crow and Dabars emphasize the interplay between form and function as integral to developing a model for the New American University. We at California Northstate also scrutinize the structure of our colleges. Though our college of health sciences has a life and physical science department, and a department of humanities and social sciences, our full-time faculty number less than twenty. We are on college and university committees together; we are, daily, visible to each other.

With varying levels of success so far, we have developed integrated course-based undergraduate research experiences for our students. In the coming year, we aim to integrate projects in humanities and social sciences courses with those from the physical sciences. Most of our students want to be health practitioners, and we endeavor to demonstrate to them the usefulness of chemistry along with service learning. As we integrate our courses, research, and outreach projects, we aim to provide students with an understanding that the pieces (courses) that make up their education unify through our work and their own.

Team teaching a research methods course with professors of genetics and chemistry in the fall of 2017, I witnessed the rigor and the creativity required for life and physical science research. Students were often confused: the teachers approached the same topics from seemingly disparate perspectives. As my PhD advisor, James Collier, often recounted to me regarding his graduate education in Science and Technology Studies (STS), graduate students were often expected to be the sites of synthesis. Professors came from traditional departments like history, philosophy, and sociology; students in STS needed to absorb the styles and techniques of various disciplines to emerge as interdisciplinarians.

Our students in the research methods class that fall saw a biologist, a chemist, and an STS scholar and likely thought: I want to be none of those things. Why should I learn how to be a health practitioner from professors that do not identify as health practitioners themselves?

When faculty adapt to meet the needs of students pursuing higher education, we often develop the kinds of creole languages elaborated by Peter Galison (1997) to help our students see the connections between traditionally distinct areas of study. Our students, then, should be educated to speak in multiple registers depending on their audience, and we must model that for them. Hailing from disparate disciplines and attempting to teach in ways distinct from how we were taught (e.g., flipped classrooms) and from perspectives still maturing (interdisciplinarity), university faculty have much to learn.

Our institutions, too, need to adapt: traditional distinctions of teaching, scholarship, and service (the hallmarks of many university promotion policies) will demand adjustment if they are to serve as accurate markers of the work we perform. Students, as stakeholders in their own education, should observe faculty as we struggle to become what we wish to see from them. Davidson, Crow, and Dabars argue that current and future crises will not be resolved effectively by approaches that imagine problems as solely technical, social, economic, cultural, or political. For institutions of higher education to serve the needs of their people, nations, and environments (just some of the pieces that must be served), they must acclimate to a world of increasing connectivity. I know: water feels wet.

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[i] My descriptions here of technological determinism and social constructivism lack nuance. For specifics regarding determinism, see the 1994 anthology from Leo Marx and Merritt Smith, *Does Technology Drive History*. For richer explanations of constructivism, see Bijker (1993), "Do not despair: There is life after constructivism," and Pinch and Bijker (1984) "The social construction of facts and artifacts: Or how the sociology of science and the sociology of technology might benefit each other."

[ii] Hardly rhetorical, that last question is live on my campus. If you have suggestions, please write me.