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This chapter focuses on the question of what it takes to bring much needed improvement to higher education, and concludes that meaningful change will likely have to come from the inside. Reasons to restructure courses in ways consistent with how our students relate to their academic and intellectual lives are presented. To reverse some troubling trends, faculty and institutions will need to inspire students to engage more fully their study and learning time.

The Need for Student Engagement

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Hearts and Minds

The most cursory look at the literature on higher education reveals that crisis rhetoric is everywhere. *Academically Adrift* (Arum and Roksa 2011) indicted the teaching and learning of critical thinking. *The Last Professors* (Donoghue 2008) and *The Fall of the Faculty* (Ginsburg 2013) concluded that shifts in governance structures and institutional priorities undermine higher education's traditional mission. *Degrees of Inequality* (Mettler 2014) and *Paying for the Party* (Armstrong and Hamilton 2015) accused universities of reproducing the existing class structure, while *Unmaking the Public University* (Newfield 2011) pointed to the same conclusion but cast blame on culture warriors. *The Lost Soul of Higher Education* (Schrecker 2010) and *University, Inc.* (Washburn 2006) decried the commodification of education and the manipulation of the research mission for financial gain.

Yet, most faculty, students, staff, and administrators on most campuses are not in crisis mode. The same is true for most legislatures and the federal government. The crisis framing of the current and future state of higher education has the problem that it is difficult to imagine what has to happen for there to be an externally forced revolution. If we are not there yet, is it likely we will be any time soon? The real challenges detailed in the crisis literature do not constitute bad news. The bad news is that we are probably not going to be forced by markets, students, public relations, or government agencies to do better. We must fix our problems ourselves.

This chapter addresses one set of challenges around pedagogy, focusing on how the educational ecosystem has changed while the typical course structures mostly have not. My aim is to bring attention to the fact that contemporary students are different than they were a few decades ago.

Although some parts of the academy have begun adjusting to this new reality, most teaching and learning has not. For instance, the majority of semester credit hours are delivered in lecture format. Lecturing has never been the best pedagogy, but using it may now border on educational malpractice, because we now know that most students do not show up to college, much less to class, with the kind of intellectual skills necessary to make meaning out of listening to a lecture.

If the accusation of malpractice seems harsh, consider these points:

1. At public universities, at least, the idea that one should be “college material” has largely been done away with in the name of access to education and its attendant benefits.
2. The fact that growth in college enrollments has far exceeded population growth as a whole means that college students are different than they used to be, both in terms of academic preparation and cultural and socioeconomic backgrounds.
3. There is strong evidence, presented below, that contemporary students learn less than students did in decades past.
4. Students’ time-management practices have changed dramatically over the last few decades. Most students do not manage their time well enough for lecture course-based learning to be successful.

Engstrom and Tinto argued in the title of their 2008 *Change* article that “Access Without Support Is Not Opportunity.” Below I will offer a brief case study that highlights some ideas about what support for students at the course level might look like. It is time to acknowledge that we cannot continue to build student-support infrastructure around the edges—learning, testing, commuter centers, and so on—and expect improved results. To reach our goals for students, we must increase and structure student academic time in ways that teach them to do it themselves and to understand what they are doing and why. Twenty-first century teaching and learning is as much about hearts as minds. We must engage our students.

Who Is in College?

It is no secret that social mobility now requires a college degree (Ng et al. 2006), but the consequences of this fact for public higher education are not widely appreciated. Post-secondary enrollments have risen dramatically over the last several decades, and in ways that have broad significance for teaching and learning. However, we do not just have more students; we have different students who have different experiences with learning different intellectual aspirations than students of years past.

According to the National Center for Education Statistics (NCES) (2017), post-secondary enrollments in the United States grew by 37.08% in the decade that began in 1999. During that same period, the U.S.

population grew by 9.7%. Between 1970 and 2014, college enrollment increased by 134.68% against a background population increase of about 55%. NCES reported that the proportion of high school graduates who attended at least some college rose from 52% in 1970 to 68.3% in 2014. NCES also reported that 20.5 million students enrolled in postsecondary education for during fall, 2016, an increase of 5.2 million over the fall of 2000. In fall, 2016, 40% of all Americans between the ages of 18 and 24 were enrolled in some kind of institution of higher learning.

These numbers matter because colleges and universities now enroll millions of students who would not have sought degrees a decade or two ago. That college enrollments is growing faster than the population means that something important is happening in the academy: either our high schools are a lot better than they used to be, or the set of skills and knowledge required of high-school graduates who are considered college material is much wider. The former conclusion is hard to credit.

Enrollment growth and the widening of the admissions pool do not tell the whole story. Pathways to college have changed as well. According to NCES (2017), the proportion of U.S. undergraduates pursuing degrees at 4-year institutions who were previously enrolled at 2-year colleges is now at an all-time high of 46%. In some states, including California (62%) and Texas (70%), the number is much higher (National Student Clearing House Research Center 2015; Jenkins and Fink 2016). Traditional college students are now outnumbered by what used to be called non-traditional students and what are now called in some circles “new-traditional” students (Jenkins 2012; Gulley 2016). The proportion of college students who are under 24, in college for the first time, enrolled full time in 4-year institutions, is 29%, according to NCES data. The percent living on campus is even smaller.

Higher education has also become more accessible to poor and minority students. According to NCES (2017), in the mid-1970s, students were overwhelmingly white. By the early 2000s, some states saw minorities constitute a majority of student populations in their public colleges and universities. In Texas, for instance, non-Hispanic whites comprised only 32% of state school enrollments in 2010, and are predicted to shrink to less than 20% by 2050, according to Murdoch et al. (2014).

These dramatic changes in the diversity of cultural and economic backgrounds on campus matter for reasons ranging from variations in tolerance of student loan debt to differences in understanding and reacting to instructor behaviors in and out of the classroom (this second issue is not well studied, but see Ogbu 1992; Gutiérrez and Rogoff 2003). Perhaps more importantly, it remains true in the United States that race/ethnicity is good proxy for median annual household income: Asian and white households make comparatively more (\$74,297 and \$60,256, respectively); black and Hispanic households make comparatively less (\$35,398 and \$42,491, respectively; DeNavas-Walt and Proctor 2015).

Barring major changes, demographic shifts in education are very likely to indicate lower retention and graduation rates nationally. College Board analyses (Ma, Pender, and Welch 2016) and the Pell Institute/Penn Ahead (2016) reveal that the income-based graduation gap is growing: Students from the wealthiest quartile of households (above \$89,125 annually) complete bachelor's degrees by age 24 at four times the rate of students from families in the next lower income quartile (between \$50,752 and \$89,124) and nine times the rate of students from the poorest quartile (below \$12,155). In 1980, the income-based graduation gap was about half as large as it is now, though, again, the student body is very different.

Priorities, Time Use, and Learning

Many, perhaps even most, bachelor's degree-seeking students in the United States now view their relationship with their academic lives in a way that faculty and administrators would find surprising. After analyzing data from a large-scale study of how University of California (UC) system undergraduates use their time, Brint and Cantwell (2010, 2014) concluded that, "current cultural norms among U.S. undergraduates support a conception of academic studies as an important, but part-time activity."

How do American undergraduates spend their time? According to Brint and Cantwell (2010, 2014), 6,300 UC students in their sample spent about the same mean average amount of time on academic pursuits (28.4 hours per week) as on watching TV, using the internet for fun, and socializing with friends (29 hours per week). More telling is the way these students used their academic time. In particular, on average they spent more time in class (15.7 hours) than on academic preparation outside of class (12.7 hours).

This is not good news, but UC students may study more than the national average. The 2015 Bureau of Labor Statistics' American Time Use Survey reported that full-time students dedicate a mean of 3.5 hours on average on weekdays and 17.5 each working week to educational activities. Assuming students also engaged in educational activities for about the same amount of time on weekends as weekdays (which is probably generous), the national average total spent on academics for full-time students may be as low as 24.5 hours per week. For decades, students have been told that the academic time-use standard is 3 hours of preparation for every hour of class time. This translates to 48 academic hours per week for a student enrolled in 12 semester credit hours (12 in-class hours and 3×12 hours of study time).

How does the current time management pattern differ from that of past cohorts of students? The answer to this question is complicated because the data sets, cohort compositions, and even the distributions of students in majors (Brint et al. 2005) vary greatly (McCormick 2011). However, most studies of student time use find that time spent studying—as opposed to being spent on all academic activities—fell from a mean of

24 weekly hours in 1961 to a mean of 14 weekly hours in 2003 (Babcock and Marks 2010, 2011). As de Vise (2012, n. p.) pointed out on the *Washington Post's* Wonkblog, “this is roughly the same time commitment expected of students in a modern full-day kindergarten.”

One important reason that students may be studying less is that they can. Students work to expectations, and while they are told that they should spend 3 hours of study time for each hour of class time, they know better. According to Rojstaczer and Healy (2010, 2012), the proportion of As “earned” by students increased from 16% of their total grades on average in 1961 to 46% in 2012. Cs were the most common grades until 1964. Bs were the most common grade from 1964 to 1996. Since the mid-1990s, As have been the most commonly awarded grade. The average GPA at 4-year colleges and universities rose from about 2.45 in 1960 to 3.15 in 2013.

Either students are becoming more efficient learners or they are learning less. All signs point to the latter. The National Assessment of Adult Literacy (2006) found troubling declines in document and prose literacy among college graduates relative to a similar study 10 years prior (Kutner et al. 2006). In 2013, the Organization for Economic Development and Cooperation’s *OECD Skills Outlook for 2013* ranked U.S. adults below average in literacy proficiency and third from the bottom in numeracy proficiency. Although this result does not show negative change over time, it does give reason for pause. The United States has massive college enrollments compared to even its recent history, but cannot break into the top half in literacy and numeracy compared to other industrialized nations. Arum and Roksa (2011) concluded that U.S. higher education is utterly failing in what it often says is its most central educational task: producing adults capable of reasoned and critical thinking, writing, and discussion.

More evidence of an important shift in attitudes toward college can be found in what students study and why. The 2011 Cooperative Institutional Research Program’s (CIRP) survey of first-year students revealed that the majority of first-year students may primarily see college as a career stepping stone rather than as an opportunity to become cultured and well-rounded thinkers (Pryor et al. 2011). In the 2011 entering class, 50.3% thought becoming a more cultured person is a “very important” reason to go to college, while 85.9%—the top response—said that getting a better job was a very important reason.

Career motivations, of course, have long been near the top of the list of reasons offered by students for going to college, and while the 2011 results flip the answer order of some previous CIRP surveys, they are not much different in degree from the pre-Great Recession 2006 survey in which the top answer was “to learn more about things that interest me.” This slight change in response combined with other facts, however, might offer reason for concern when we think about pedagogy that relies heavily on unstructured student contributions to learning.

This point holds especially true for first-generation students, for whom career and financial factors have more weight in decision-making compared to their peers. Brint et al. (2005) noted that over the same period that enrollments have risen, students have moved *en masse* from the liberal arts to the practical arts—majors designed to directly prepare students for the workforce such as business, engineering, nursing, and public administration. Similarly, Levine and Dean (2012, 37) concluded that “this is a pragmatic, career-oriented generation . . . their view of the value of higher education and their goals for college are much more utilitarian than their predecessors of the past four decades . . .” Nathan (2005, 100) provided related insights after a year living in a dorm with first-year students. Tallying the results of her interactions with students, she concluded that intellectual life is “not a significant part of college culture.”

What does all this mean? Concerns about college access have not caused the worthy undergraduate population of yore to be overtaken by unwashed masses who refuse to study. However, today’s students may need to be *inspired* to take up a life of the mind, which likely means that they will have to be *convinced* of notions that more students in previous generations may have been willing to take for granted: that knowledge, culture, critical thinking, and reflective judgment are valuable skills to develop. It may not be enough to assign reading, present material in lectures and discussions, and then give exams. Indeed, this approach may be precisely the wrong way to teach contemporary students because it fails to engage them sufficiently.

Increasing and Structuring Academic Time on Task: A Case

It is not really news that most college instruction does not meet the standard of care specified in the research on teaching and learning. Education experts, psychologists, educational sociologists, and other experts have been pointing out at least since the 1960s that the commonly employed passive lecture presentation is not as effective as other teaching techniques. In an oft-cited study, Dale (1969) found that students recalled about 25% of lecture content 3 hours after the lecture, and somewhere between 10% and 20% after 3 days. More recent studies argue for lower numbers, with Bligh (2000) finding less than 10% retention after 3 days for most students.

Much has been said in recent years against lecture-based teaching and in favor of discovery-based learning (e.g., Hamilton 2013). The lecture, however, is not the problem, and it never has been. The problem is lack of student *engagement*. Students learn less well in lecture-based courses not because lecture courses are inferior *simpliciter*, but because students generally do not engage in behaviors that help make lectures effective and instructors do not hold them accountable.

It would be foolish to insist that everyone should just study more. Given the way most courses are structured, there is no incentive to do so. Students do not know how to fill the 23.5 hours gap between the academic

time use standard of 48 hours and their current practice of 24.5 hours productively. When students increase their study time, they tend to engage in relatively low pay-off, massed-practice activities (Brown et al. 2014). This practice is one likely reason why my students who did well in high school fail my second midterm after dramatically increasing study time after they failed the first midterm: They double down on a bad strategy. What, then, can we do?

In the current financial climate, getting rid of lecture pedagogy is not the answer—or at least not the whole answer. We can, however, structure our courses in ways that increase student study time and make it more effective: We can organize our lectures, assignments, and tests in ways that teach students to study more effectively.

After noticing that students were not buying, much less reading, textbooks for my large introductory biology course, my co-instructor and I decided to assign one interesting reading for each lecture, for example, explorations of biological systems and accounts of scientific discoveries from various web sources, and discussions of controversial topics in biology from the National Institutes of Health (NIH) or the *New Yorker*. We believed that students would become interested in a controversy, new discovery, case study, or ethical dilemma and thereby be motivated to learn biology as well as reflect on what the science meant for them.

Over two semesters, average student on-time access of the documents was 27%, even when students were told that the instructors could see whether and when they downloaded the materials and even when clicker quizzes were frequently administered in class. More than two thirds of the students did not access the assigned reading before class. Incidentally, this result matches the national trends fairly well. NSSE (2011) data indicated that almost 80% of freshmen and 85% of seniors reported having gone to class without doing assigned readings.

In revising my course, I made two critical mistakes. First, for many students, an article from a weekly literary and news magazine is exactly as tedious as a textbook chapter. Second, asking students to be actively learning without first providing a structure or incentive for doing so ignores everything I said above about who is in college, why they are there, and what they hope to get from it.

As a next step, I combined the interesting course-reading idea with the idea that structured time on task is better time on task. In collaboration with a publishing company that had developed a set of virtual labs for high school and college biology courses, my colleagues and I developed a set of homework assignments by adapting the existing labs. We structured students' contributions to their own learning by associating particular readings with each lecture period, associating an online lab exercise with each piece of reading as homework, and then giving the homework portion of the course substantial weight as a proportion of the final grade. We delivered readings and homework using an education-specific e-reader. This e-reader

has a set of smart link features that instructors can use to markup documents for students and to embed notes, questions, and hyperlinks in the text or margins. We used these features to navigate students from the reading to auto-graded homework assignments to ask them to apply what they had read to new situations.

For instance, after reading a few paragraphs from a primary source about variations over time in beak depth in Galápagos finches, we asked students to access a dynamically modeled finch population to see if they could demonstrate understanding of biological fitness and differential reproduction by correctly predicting outcomes for beak depth in evolutionary situations that were slightly different than the one they had read about. This same simulation would also be used to approach still harder conceptual questions in class. Introducing it as homework accomplished two tasks: familiarity with using a population model to ask and answer questions, and increasing structured time on task before class.

In a summer session pilot group, 85% of students accessed exercise-associated readings on time, and the median test score for associated test questions rose by nine points. The tests used in the summer course were virtually identical to the tests in the previous version of the course. This increase in scores may also have been due to a substantial decrease in class size, or to the compressed schedule of the summer term, so more research is needed. There are, however, better-controlled studies that give reasons to believe that our results were robust. More encouraging still, these studies show that while all students benefit from highly structured courses, students from under-represented minority groups benefit disproportionately (Freeman et al. 2014; Haak et al. 2012; Eddy and Hogan 2014).

My collaborators and I worked hard to encourage engagement with the course by prompting students to participate in the class much more frequently and more intensively than they would have under usual teaching practices, even in a course that was still largely lecture-based. We made our course much less a part-time endeavor and much more a part of students' daily lives. In short, we tried to take everything we learned from reading about who students are and built a class from which we hoped they could effectively learn.

Conclusion: It Is a Start

Higher education should be proud of the gains it has made in offering access to all students who seek higher education. Yet, there is much to be concerned about including massive student loan debt and large—and rising—disparities in graduation rates between rich and poor students. This chapter began with the question of what it could possibly take to bring much-needed changes to higher education, as well as an argument to the conclusion that meaningful change will likely have to come from within.

I have offered several reasons to restructure courses in ways that are consistent with the ways modern students relate to their academic and intellectual life. In particular, I have urged that to reverse troubling downward trends in time use, we need to motivate students to increase their time on task in ways that they find engaging and meaningful. Given that students generally do not arrive at college knowing how to manage time well, we have to structure their out-of-class study time carefully, especially in introductory courses. There are surely many ways to accomplish this task. I have given one example and pointed to others.

Better course structures will not begin to address the host of challenges we need to face if higher education is to live up to its fullest promise. We cannot, however, let the perfect be the enemy of the good. There is much individual faculty members can do, even in the publish-or-perish large-lecture environment to help students engage with academic life. It can start with assignments, grading structures, and classroom time allocations that engage students more often and more intensely by increasing and structuring their academic time.

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