Reading Packet for:
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Chancellor Rebecca Chopp
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The Soul of the Research University

By Nicholas Lemann

The two most important developments in American higher education in the 20th century were, arguably, contradictory. First, building on the foundation laid by the Morrill Act of 1862, which gave federal land to states to create colleges that taught "agriculture and the mechanic arts," we created the world’s first mass higher-education system. When the Carnegie Corporation of New York was founded, in 1911, "to promote the advancement and diffusion of knowledge and understanding," fewer than 3 percent of Americans between the ages of 18 and 24 were students in institutions of higher education. About 350,000 young Americans were enrolled in fewer than 1,000 institutions of higher education. Some hundred years later, more than 35 percent of 18- to 24-year-olds are enrolled, and about two-thirds of high-school graduates immediately go on to get more education. The United States has 20 million students in 4,500 institutions of higher education.

Second, building on the foundation laid by the establishment of The Johns Hopkins University, in 1876, American higher education has embraced the idea of the research university as its most cherished aspiration. Today there are about 300 American universities that confer doctoral degrees, far more than envisioned by the original proselytizers for importing the research-university model from Germany to the United States. And that number understates the importance of the model, because the core members of the faculty and senior administration at hundreds more institutions hold doctoral degrees and operate within the academic tenure system that lies at the heart of the way research universities are run.

For many people who have spent their lives working in higher education, mass higher education and research universities make for a perfect fit: Together they express both the public service and the intellectual ambitions of educators. And during most of the 20th century, especially the years between 1950 and 1975, the two big ideas grew and flourished in tandem.
But they aren’t the same idea. Mass higher education, conceptually, is practical, low cost, skills oriented, and mainly concerned with teaching. It caught on because state legislatures and businesses saw it as a means of economic development and a supplier of personnel, and because families saw it as a way of ensuring a place in the middle class for their children. Research universities, on the other hand, grant extraordinary freedom and empowerment to a small, elaborately trained and selected group of people whose mission is to pursue knowledge and understanding without the constraints of immediate practical applicability under which most of the rest of the world has to operate. Some of their work is subsidized directly by the federal government and by private donors, but they also live under the economic protection that very large and successful institutions can provide to some of their component parts.

I have an immigrant’s perspective on higher education, having spent most of my adult life working for news organizations and then, through a series of happy accidents, having become a dean at a major research university in middle age. No matter how much you think you understand how central research is to the university, you can’t truly feel its centrality until you have experienced university life from the inside, at a fairly high level.

Of the many stakeholder groups in higher education, the most powerful, at least at research universities, is the tenured faculty, and the ticket for admission to that group is first-rate research. Very-high-achieving people who have devoted their careers to research, and who use evaluations of research quality to perform continuing, fairly merciless evaluations of their peers and would-be peers, will naturally see research as the central activity of their institutions. Research is a major income generator for the top universities. Research is central to the immensely appealing conception of the university as an autonomous institution with the freedom to make its own rules.

It’s also the case that university leaders, when speaking to the nonuniversity world, rarely present research as the clear central purpose of the university. Tens of millions of Americans have a direct connection to higher education, and probably only a tiny minority of them are even familiar with the term "research university." So universities
themselves have contributed to the lack of public understanding of the centrality of research.

At the "TIME Summit on Higher Education" that the Carnegie Corporation of New York and Time magazine co-sponsored in September 2013 along with the Bill & Melinda Gates Foundation and the William and Flora Hewlett Foundation, the disconnect between the views of the research university from inside and outside was vividly on display. A procession of distinguished leaders of higher education mainly emphasized the need to protect—in particular, to finance adequately—the university’s research mission. A procession of equally distinguished outsiders, including the U.S. secretary of education, mainly emphasized the need to make higher education more cost-effective for its students and their families, which almost inevitably entails twisting the dial away from research and toward the emphasis on skills instruction that characterizes the mass higher-education model. Time’s own cover story that followed from the conference hardly mentioned research (it was mainly about how much economically useful material students are learning), even though the research university was explicitly the main focus of the conference.

At the conference, there was a lot of talk about maintaining American "competitiveness" in the global economy as the main justification for the university’s research mission—and the idea of crisis was pervasive. But how the crisis was defined depended on who was defining it: Those who don’t work in higher education usually see it as a crisis of high cost and impracticality, and those who do work in higher education usually see it as a crisis of insufficient resources. An unschooled observer who wandered into the conference might have left feeling impressed with many of the specific ideas but confused about the overall situation.

The ur-text about higher education, at least for educators, is The Idea of a University, by John Henry Newman. It is an odd choice: a disjointed, incomplete series of lectures from the 1850s, mainly devoted to an issue nobody worries about
much any more (the independence of universities from organized religion), and explicitly opposed to the research-university ideal, which was emerging at the time. Newman was making a case, essentially, for Oxford as University in the early 19th century: a university for aristocrats and scholars, unscientific, undemocratic, highly personalized, gloriously impractical. And yet such eminent 20th-century writers on higher education as Alfred North Whitehead, Abraham Flexner, and Clark Kerr all demonstrated in their writings a deep debt to Newman. In 1992 the distinguished historian Jaroslav Pelikan published a book called The Idea of a University: A Reexamination, which is a lecture-by-lecture update of Newman.

Why is Newman so enduringly appealing? Part of the reason is that, because universities are so large and do so many different things, very few people have been able to state their central purpose succinctly and persuasively. Part is Newman’s wise and elegant writing style. And part is his core idea that the university should be a self-governing institution, devoted to knowledge as an end in itself, set apart and protected from the other main institutions of society, which will always try to bend it to their own purposes. "You see then, here are two methods of Education; the end of the one is to be philosophical, of the other to be mechanical; the one rises toward general ideas, the other is exhausted upon what is particular and external," he wrote.

"Knowledge, in proportion as it tends to be more and more particular, ceases to be Knowledge."

Abraham Flexner’s Universities: American, English, German, published in 1930 in a mood of celebration of the successful importation of the German research-university model to the United States over the preceding generation, begins with a tribute to Newman, but then significantly departs from the territory Newman delineated for the university. Flexner’s ideal university was deeply engaged with the world, especially through the new social sciences. What Newman meant when he used the term "knowledge" was the accumulation, not of information and skill, but of understanding and perspective. Flexner’s ideal was the similar-sounding but actually quite different "advancement of knowledge," for which he imagined substantial worldly applications. That and "solution of problems," he wrote, he considered to be "interchangeable phrases." Universities were uniquely well suited to make the world a better place.
But Flexner was aware that in proposing that universities have a far more utilitarian mission than the one Newman had in mind he was entering a realm of potential peril: Universities might be turned into entirely practical institutions, put at the immediate service of every outside entity and social need. "But a university should not be a weather vane, responsive to every variation of popular whim," he wrote. "Universities must at times give society, not what society wants, but what it needs. Inertia and resistance have their uses, provided they be based on reasonable analysis, on a sense of values, not on mere habit."

Flexner was especially skeptical of universities' undertaking to teach their students anything practical: "The pursuit of science and scholarship belongs to the university. What else belongs? Assuredly neither secondary, technical, vocational, nor popular education. Of course, these are important; of course, society must create appropriate agencies to deal with them; but they must not be permitted to distract the university." Flexner disapproved, for example, of research universities' being home to any form of professional education except in law and medicine: not business schools, journalism schools, schools of education, or denominational divinity schools. That is why, even for him, Newman served as a valuable anchor to windward.

Clark Kerr delivered the Godkin Lectures at Harvard University more than half a century ago, in the spring of 1963, during what looks in retrospect like the historical high-water mark of American optimism. That mood pervades the lectures. Kerr gave the book version of the lectures a title that explicitly echoes, but also rejects, Newman: The Uses of the University. (Newman didn't want universities to have uses.) The book has been through a series of editions over the years, and it still stands as about the best concise, coherent, nonbloviating explanation of what an American university is supposed to be.

Kerr shared with Newman a passion for the university as an independent, almost magically self-contained institution, and he shared with Flexner a devotion to the research-university ideal. But he was willing to go much further than Flexner in suggesting that the university could safely take on a wide range of educational and social missions—hence the term he coined for it, the "multiversity." The mass-higher-
education and research-university ideas, Kerr confidently asserted, "turned out to be more compatible than might at first appear."

Flexner was writing as an intellectual; both Newman and Kerr were writing as intellectuals who were also administrators. In Kerr’s case, he was, as president of the University of California, chief administrator of the world’s largest higher-education institution, and he was well aware that the compatibility he saw between the two dominant university missions needed, at the very least, some minding. Kerr wrote that there were only 20 true research universities in the United States, and he didn’t complain that was too few. In California, the state colleges were constantly lobbying the Legislature to be upgraded to the alluring status of universities. Kerr’s response was to persuade the Legislature to pass a sweeping master plan for higher education, built around a grand bargain between the two models: On the democratizing side, everyone in California would have the right to a tuition-free higher education, and on the research side, nobody in the vast system except a handful of elite, well-financed universities would be permitted to offer doctoral programs.

Kerr’s historic achievement began unraveling almost immediately. In the short run, the Free Speech Movement at Berkeley, which came the year after the Godkin Lectures, unpleasantly surprised him. The election of Ronald Reagan as governor of California in 1966, partly because Reagan had tapped into the public’s resentment of the student protests, was another surprise. And shortly after taking office, Reagan arranged for Kerr to be fired. In the longer run, both of the key elements of the master plan were abrogated. The California state-college system is now the California State University system, and public higher education in California has not been tuition-free for decades. It is still an outstanding system, but not quite so paradisiacal or conceptually neat as Kerr believed it could be.

Because higher education is expected to do so many things, it can’t possibly do all of them at peak efficiency all the time.
Today’s crisis in higher education, it should be noted, is not like the 2008 financial crisis, or the crisis in the big-city newspaper business that many journalists like to use as a point of comparison when discussing higher education. It is more prospective than actual; colleges and universities aren’t going out of business en masse, or even, across the board, significantly curtailing their operations. Because higher education is expected to do so many things—teach everything from philosophy to prison administration, operate winning sports programs, provide in-person management of the transition from adolescence to adulthood, make local economies prosper, be direct providers of medical care, and on and on—it can’t possibly do all of them at peak efficiency all the time. The word "crisis," denoting a wide variety of specific problems, has appeared consistently in discussions of higher education, even when, in retrospect, higher education was not in crisis.

What seems to be at the core of today’s perception of crisis is cost. Tuition, especially at research universities, has risen more rapidly than inflation for many years. The price of anything is, ultimately, what people are willing to pay for it, and there is a sense among both educators and the public that the wonderfully (from the universities’ point of view) inelastic demand of recent decades may have run its course. To say that requires a series of immediate caveats.

First, at private colleges and universities, the stated tuition is frequently abated by scholarship aid and discounting, and shouldn’t be understood as what people actually pay. Second, the scary statistics you see about student debt are usually cherry-picked to produce numbers that overstate the national per-student average. Third, increased costs at public universities are substantially the result of significant cuts in states’ legislative funding, not of universities’ gold-plating their operations. Fourth, for each individual American family, a college degree continues to be the one thing most likely to improve its children’s economic fortunes. Still, the sense that something fundamental may be changing in the economic compact between higher education and the public is palpable.
Why? The overall statistical economic case for higher education is at war with a widespread fear that membership in the middle class is getting harder and harder for the rising generation to achieve—especially for those who study the humanities or the nonquantitative social sciences in college. The idea that any family resources devoted to higher education will pay off economically may be going the way of the idea that all single-family homes will rise in value every year. In the nonacademic world, technological advances have made many products and services cheaper. It seems impossible that the same can’t be true in higher education—especially with the advent of online courses.

On the other side of the transaction, it is very difficult for institutions of higher education, especially research universities, to reduce their costs. The "cost disease" in talent-based organizations that offer in-person services, which the economist William J. Baumol identified back in the 1960s, means that universities have to keep paying their professors more without getting productivity increases in return. Competing for faculty members (often in the hope of getting research money as a payoff) is expensive, and so is competing for students by offering them more and more amenities.

As nonprofit, large, complex institutions, universities wind upshouldering costly social burdens. Most of them still maintain the kind of benefits for full-time employees (retirement accounts, generous health plans, job security, and so on) that are disappearing in private companies, and much of the substantial recent increase in the number of administrators has to do with some admirable additional missions (community outreach, faculty diversity, environmental stewardship, student counseling) that the university has taken on. The more fortunate universities have substantial endowments, but they are nonprofits, and their income is not supposed to far exceed their expenses, and so they operate on very slim cash margins. Many are coming to rely increasingly on part-time faculty members with no job security or benefits, simply because that is cheaper.

Underlying all of this is the fundamental problem of the country’s having adopted two noncongruent ideals of higher education. With only a few exceptions, like the
National Science Foundation, most of the stakeholders that provide resources to universities—including parents, students, alumni donors, legislatures, businesses, and foundations—believe they are paying for skills-conferring, teaching-centric institutions. And most of the senior leaders of universities believe that the institutions’ core mission is research. Presidents and provosts know that raising the research status of their university is what would make their peers judge them as successful. Faculty members know that the quality of their research is the prime determinant of the course of their careers.

Research is expensive. In the sciences, it requires laboratories. In all fields, it drives teaching loads down, and therefore payrolls up. The implied intellectual model pushes the better colleges and universities to operate dozens of academic departments, some of them lightly populated by students. The research-university model is designed to make it difficult for institutions to react in real time to change, in the way that for-profit businesses try to. If there is an imperative to reduce costs, research universities are not built to respond to it naturally and swiftly.

One can say, and be partly right, that better communication about research could lessen the cost pressure. Presidents, provosts, and deans, as they incessantly bustle about from event to event, face a constant temptation to deal with each constituency group on the level at which it interacts with the university. Why talk to the athletics boosters about the classics department, or try to sell the business council on tenure, or tell students that it’s not really in their interest to have faculty members who do nothing but teach?

As no one can fail to have noticed, it is possible on the very rare occasions when the whole university community gathers, like commencement ceremonies, for the senior leadership to power through by delivering a series of inoffensive bromides. That is a temptation to be resisted. The research-university model will be subjected to increasing challenges, and university leaders have a responsibility to talk more openly to the public about the centrality of research to the university mission. Ideally, when they do so, they should not confine their sales pitch only to the most obviously beneficial products of university research—silicon chips and vaccines and so on—but
should also promote the more essential and also more difficult idea of the university as a realm not entirely devoted to what seems at the moment to be most practical.

Having spent the past 10 years as dean of a journalism school, in one of the more skills-oriented domains in higher education, I am familiar with the arguments against keeping the university at a distance from the rest of the world. Why wouldn’t you want to make the university resemble the professional workplace as closely as possible? (One of the leading American journalism schools uses the advertising slogan, "Our Classrooms are Newsrooms.") Why would you want to be taught by professors who devote a substantial part of their time to writing projects, instead of working professionals whose only role at the university is to teach? Why shouldn’t the curriculum be devoted to imparting the most up-to-the-minute skills, the ones that will have most value in the employment market? Embedded in those questions is a view that a high-quality apprenticeship under an attentive mentor would represent no loss, and possibly an improvement, over a university education.

Universities are just about the only institutions that are set up to transcend the limits of time, location, and immediate circumstance that constrain just about all workplaces. If they take full advantage of that, they can impart to the mind an ability to achieve dispassionate distance, to assess, to contextualize, to connect—as John Henry Newman put it, "a power of judging of passing events, and of all events, and a conscious superiority over them, which before it did not possess." Universities can bring the world from two dimensions into three. I can’t resist quoting Newman again, at some length:

That perfection of the Intellect, which is the result of Education, and its beau ideal, to be imparted to individuals in their respective measures, is the clear, calm, accurate vision and comprehension of all things, as far as the finite mind can embrace them, each in its place, and with its own characteristics upon it. It is almost prophetic from its knowledge of history; it is almost heart-searching from its knowledge of human nature; it has almost supernatural charity from its freedom from littleness and prejudice; it has almost the repose of faith, because nothing can startle it; it has almost
the beauty and harmony of heavenly contemplation, so intimate is it with the eternal order of things and the music of the spheres.

That may sound luxurious, and it is. It may also sound impractical, but it's not. (What can be impractical is using one's time at a university to acquire skills that may turn out to be valuable for only a short time.) To be able to come closer than most people can to seeing things deeply and as they really are is an enormous advantage in life, including in a career.

One can get meaningfully closer to that state by studying literature or theology, if they are taught properly, as well as by studying computer science and economics. Faculty members who are deeply engaged in intellectual production will be far better at getting their students there than professors who see their mission as conferring a set of specific skills or facts. When university leaders, in making the case for the research university, emphasize its practical utility because they believe that will be the only persuasive argument, they are leaving an important part of their mission undone.

If things proceed on the course they seem to be on now, and cost is a big problem, then universities will change—and the universities whose supporters are the most price-sensitive will change the most. Many of them will change not through any orderly and planned process, but through budget-cutting exercises that financial necessity has imposed on them. And it's obvious what the direction of those changes will be: away from the research-university idea, toward the "mechanic arts."

There will be fewer humanities departments, fewer doctoral programs, a smaller proportion of faculty members who do research and have tenure, less individual instruction, less campus residency by students, curricula canted toward job skills—in Newman's terms, more emphasis on learning, less on knowledge. That's not a nightmarish outcome, but it will mean that the lucky minority of students who get to attend true research universities will have a profoundly different, and profoundly more advantageous, education than the majority who don't. It was America's democratizing tendency, not the intent of the leading planners of the higher-education system, that brought us a substantial number of nonelite universities with research aspirations. If
cost pressures extinguish those aspirations, then the resulting system will be less democratic.

Universities can be counted on to advocate for themselves. They will always ask for more independence and more resources. They may or may not try to get out ahead of events and change voluntarily, calmly, in a noncrisis atmosphere. But if they do, how should they do so? Most of the changes that are coming will be necessities, imposed from without. What changes would be desirable, and ought to come from within?

I have already said that I've been struck by how little most of the university's stakeholders—everybody, really, except faculty, senior administration, and research funders—understand and embrace the research mission of the university. What has struck me about the people who embrace research is a fundamental difference in institutional orientation. Most people work for their employers. Faculty members at research universities work for their disciplines. If you want to advance in your career, your stature within your discipline is far more determinative than your status within your university. A faculty member at a research university will self-identify by discipline, not by university: "I'm an economist," not "I work for the University of Alabama."

Collectively, academic disciplines represent an amazing achievement. They are robust, global, intensely networked and collaborative communities. They are self-governing and highly productive. They are also an excellent example of how to make a socially useful nonmarket activity economically self-sustaining—partly through outside funding, and partly through the disciplines' having made their internal peer valuations into the hiring-and-promotion standards of universities. Disciplines can't pay salaries, but universities do.

This system is not especially advantageous for presidents, provosts, and deans, who must answer to additional constituencies and who are paid to look after entire schools
and universities. A research university is often, in the aggregate, a stunning collection of expertise and talent across a dazzling range, which is not getting the full advantage of its own intellectual resources because they are situated inside departments and schools that are more oriented toward the same departments and schools at other universities than toward their local colleagues in other disciplines. Because the reward system for faculty members at research universities so strongly privileges research over teaching, students are often not getting the full advantage of the faculty talent that surrounds them, either.

If university research were more oriented toward the institution where it takes place, and less toward the discipline, there would be a number of powerful benefits. It is expensive for colleges and universities to compete ferociously with each other, school by school and department by department, for incremental advantages in research prestige. If, as Columbia University’s former provost, Jonathan R. Cole, has suggested lately, individual universities were able to specialize more by forming alliances that would concentrate expertise in one location rather than trying to replicate it everywhere, that could be a way to control costs. As specialties were parceled out, online education would make it possible for students in one university in the alliance to take locally unavailable courses from another university in the alliance. Within each university, more cooperation across disciplines could generate new intellectual ferment, which could produce both research breakthroughs and a richer, more interconnected curriculum. It could also lead to more collaboration on research applications, which would make it much easier for university leadership to make the public case for research. Making research more institution-oriented would also give universities a way to make teaching a more genuine determinant of faculty careers, rather than a mainly notional one, and to explore more vigorously the pedagogical potential of online education, including for resident students.

The academic disciplines became so strong thanks to a set of structures that were designed artfully enough that over time they were able to become quite powerful.
These include each individual disciplinary association, with its all-important annual convention, where careers can be meaningfully advanced; the key academic journals within each discipline; the university presses; the logistical substructure that makes it easy for professors to move around from institution to institution, such as the retirement-account system, uniform student-admissions tests, and systemic means of handling library resources and the practice of making tenure decisions substantially on the basis of evaluations of published work by colleagues in the same discipline at other universities. For all the talk about higher education not getting the Internet, the advent of the online world has tremendously strengthened disciplinary life by making the global peer-to-peer communication that has always been one of its key features so much easier.

To orient academic research more—not completely, but more—toward the needs of the home institution would require not just exhortation but also the building of a similar set of structures that altering the incentives for individual faculty members. These would fall into two broad categories: hiring-and-promotion (especially tenure) standards, and enabling mechanisms for conducting and disseminating research. The first of these could give special weight to interdisciplinary or applicable research, to written evaluations of intellectual quality from people in other, related disciplines, and to advances in pedagogical technique. The second could provide funding from university sources and create prestigious new publishing venues for valuable research that the traditional discipline funding and publication venues would be unlikely to support.

Clark Kerr remarked that the oldest European research universities, established during the Middle Ages, were among the least changed institutions in all of human experience. He meant that as praise, mostly; in the current moment of reverence for innovation, people would hear it as a rebuke. In any event, it is inescapable that universities’ peculiar survivability and their slow-moving quality are inextricably linked. They ignore almost no important development in society, but they assimilate no single development instantly and totally.
Disrupting Ourselves

The Problem of Learning in Higher Education

By Randy Bass

Our understanding of learning has expanded at a rate that has far outpaced our conceptions of teaching. A growing appreciation for the porous boundaries between the classroom and life experience, along with the power of social learning, authentic audiences, and integrative contexts, has created not only promising changes in learning but also disruptive moments in teaching.
By “disruptive moments,” I’m not referring to students on Facebook in classrooms. I mean “disruption” in the way Clayton Christensen uses the term. Christensen coined the phrase *disruptive innovation* to refer to a process “by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves ‘up market,’ eventually displacing established competitors.” By using the phrase “disrupting ourselves” in this article’s title, I am asserting that one key source of disruption in higher education is coming not from the outside but from our own practices, from the growing body of experiential modes of learning, moving from margin to center, and proving to be critical and powerful in the overall quality and meaning of the undergraduate experience. As a result, at colleges and universities we are running headlong into our own structures, into the way we do business.

**FIGURE 1. PRESSURES ON THE FORMAL CURRICULUM**

![Diagram showing pressures on the formal curriculum]

We might say that the formal curriculum is being pressured from two sides. On the one side is a growing body of data about the power of experiential learning in the co-curriculum; and on the other side is the world of informal learning and the participatory culture of the Internet. Both of those pressures are reframing what we think of as the formal curriculum. These pressures are disruptive because to this point we have funded and structured our institutions as if the formal curriculum were the center of learning, whereas we have supported the experiential co-curriculum (and a handful of anomalous courses, such as first-year seminars) largely on the margins, even as they often serve as the poster children for the institutions’ sense of mission, values, and brand. All of us in higher education need to ask ourselves: Can we continue to operate on the assumption that the formal curriculum is the center of the undergraduate experience?

This tension between an expansion of learning and the limits of our structures is intrinsic to the learning paradigm. In the 1995 article “From Teaching to Learning,” Robert Barr and John Tagg wrote that higher education was in a powerful transition, moving from an instructional paradigm to a learning paradigm—from offering information to designing learning experiences, from thinking about inputs to focusing on outputs, from being an aggregation of separate activities to becoming an integrated design. Barr and Tagg added that it would take decades for higher education to fully make this shift.

Now, fifteen-plus years into that shift, our understanding of learning is expanding in ways that are at least partially incompatible with the structures of higher education institutions. In addition, these developments are occurring at the same time that higher education is being asked to become more accountable for what students are learning. Ironically, these pressures for accountability are making us simultaneously more thoughtful and more limited in what we count as learning. The question that campus leaders need to address is how to reinvent a curriculum that lives in this new space.

**The Post-Course Era**

One of the consequences of the shift from the instructional paradigm to the learning paradigm is that it takes us beyond the centrality of the bounded course, into what I call the “post-course era.” The idea of the course has several functions in our institutions; courses are primary tools for managing time, staff, and resources. And they are the building blocks for telling the story of a discipline or a field as it is expressed through the curriculum and translated into majors. Courses in these senses are not going away and will be with us for a long time. What I am referring to here is the imagined meaning that we give to courses—more specifically, the way we talk about courses and the curriculum as the center of the undergraduate experience.

By using the phrase “post-course era,” I’m not saying that courses cannot be the site of effective teaching and learning. I will argue later how I think that can indeed be the case. On every campus there are committed and creative faculty whose courses are memorable and have impact for many students. What I am arguing is that we have reached the end of the era of assuming that the formal curriculum—composed of bounded, self-contained courses—is the primary place where the most significant learning takes place.

The Association of American Colleges and Universities (AAC&U) previewed this shift almost ten years ago, in the influential report *Greater Expectations*, which argued: “The shape of the undergraduate curriculum was essentially fixed half a century ago.” This shape included the solidification of locally controlled courses as the core of the experience: “Although listed in the catalog as part of a curriculum, individual courses are effectively owned by departments, and most advanced courses by individual professors. Few faculty members teach to collectively owned goals. The student assembles an assortment of courses, each carrying a defined number of credits and assuming a standard time in class. The degree certifies completion of a fixed number of these often disconnected fragments. There is little internal coherence in curricula or programs, and even less a plan for connected learning.”

Just about all of the broad curricular innovations of the last few decades, from general education to co-op education, have wound around these basic conditions, but have done little to change them.
The Re-centered Curriculum
So, what’s disrupting courses and the formal curriculum? If they are no longer the essential core of the undergraduate experience, what is? In 2008, the National Survey of Student Engagement (NSSE) published a now-familiar list of what is referred to as “high-impact practices.” These are the college experiences that highly correlate to the most powerful learning outcomes. Students’ participation in one or more of these practices has the greatest impact on success, on retention, on graduation, on transfer, and on other measures of learning:

- First-year seminars and experiences
- Common intellectual experiences
- Learning communities
- Writing-intensive courses
- Collaborative assignments and projects
- Undergraduate research
- Diversity / global learning (study abroad)
- Service learning, community-based learning
- Internships
- Capstone courses and projects

These are called “high-impact practices” because participation in them correlates with high retention and persistence rates. These practices also have high impact because they induce, according to George Kuh, student behaviors that lead to meaningful learning gains. The important student behaviors include the following:

- Investing time and effort
- Interacting with faculty and peers about substantive matters
- Experiencing diversity
- Responding to more frequent feedback
- Reflecting and integrating learning
- Discovering relevance of learning through real-world application

Where are the high-impact practices located? Many of these practices are not part of the formal curriculum but are in the co-curriculum, or what we used to call the extra-curriculum (e.g., undergraduate research). The rest are special or exceptional curricular experiences (e.g., first-year seminars and capstones).

From the perspective of the impact on learning, this intersection of the most learning-intensive experiences in the co-curriculum and in the few exceptional, often experientially focused courses in the formal curriculum forms the new center—the recentered core—of undergraduate learning. Indeed, in my experience of holding focus groups and informal conversations with students, if you ask them where they think their deepest learning has taken place, they will sometimes point to one or two courses that had meaningful impact for them. But for collaboration and social learning, or redesign when and how students can engage course content. Indeed, one of the most powerful aspects of today’s technologies is that many of the high-impact features that used to be possible only in small classes can now be experienced not only at a larger scale but, in some cases, to better effect at larger scale.

A second response to the location problem of high-impact practices is to design for greater fluidity and connection between the formal curriculum and the experiential co-curriculum. An example is the use of e-portfolios, which allow students to organize learning around the learner rather than around courses or the curriculum. Once intended for assessment or employment presentation, if most of the formal curriculum is not where the high-impact experiences are located, what are our possible responses?

e-portfolios are being reinvented as integrative spaces across the undergraduate experience. They are being used in learning communities and first-year experiences, sometimes spanning from general education to internships and capstones. As Bret Eynon puts it: “Drawing on the power of multimedia and personal narrative, recursive use of ePortfolio prompts students to expand their focus from individual courses to a broader educational process.” The continued growth of e-portfolios across higher education reveals a restless search for ways to find coherence that transcends courses and the formal curriculum.

I am naming here those approaches particularly relevant to instructional technology. There are, of course, myriad other approaches, both established and emerging (e.g., civic engagement and community-based learning), that bridge the classroom with experiential learning. I think it is also possible to work with faculty to create course designs with a “post-course” consciousness, paying attention to such elements as prior learning and prior conceptions, experiential knowledge, program-wide learning goals, and...
the long view of expert practice. There are also many ways to create assignments (and reflections to go with assignments) that gesture beyond the course itself—to life experience, to other courses, or to larger communities of practice, for example. These kinds of post-course consciousness strategies not only acknowledge the role that any course can play in building certain kinds of foundational knowledge and skills but also recognize the fluid boundaries of the course within a larger context of learning experiences.

**Participatory Culture**

A second pressure on the formal curriculum is the participatory culture of the web and the informal learning that it cultivates. Several years ago, Henry Jenkins and his colleagues published the report “Confronting the Challenges of Participatory Culture.” They looked at a range of web cultures, or participatory cultures, including Wikipedia, gaming environments, and grassroots organizations. They compiled a list of what they considered to be the shared and salient features of these powerful web-based communities:

- Low barriers to entry
- Strong support for sharing one’s contributions
- Informal mentorship, from experienced to novice
- A sense of connection to each other
- A sense of ownership in what is being created
- A strong collective sense that something is at stake

I don’t know that every college course needs to function like this, but it is worth asking the question: How many college classrooms or course experiences include this set of features? In how many courses do students feel a sense of community, a sense of mentorship, a sense of collective investment, a sense that what is being created matters? It is no coincidence that these features of web-based communities have much in common with the traits that make high-impact practices so effective.

Some might question whether most courses in the formal curriculum need to be designed for this kind of learning and intellectual community. Clearly, students learn foundational and essential knowledge and skills in courses, and then they put that knowledge and those skills to use in high-quality life experiences or learning experiences outside the classroom. Maybe that’s the intended role of the formal curriculum: to prepare students to have integrative experiences elsewhere. But if we actually followed the logic of that position, we would be making many different decisions about our core practices,
especially as we acquire more and more data about the power and significance of those experiences. Those choices might include more significant shifts from inputs to outcomes, reinvestments moving more resources to the centered core, redefinitions of what we mean by “faculty load,” changes in how we count departmental productivity, and an expanded repertoire of ways for documenting learning achievement. And it would also follow that our course management systems would be organized differently. After all, the post-course era would need a post-course management system.

Reversing the Flow
When John Seely Brown talks about what he calls “reversing the flow,” he claims that the typical school curriculum is built from content (“learning about”) leading to practice (“learning to do”), where the vast majority of useful knowledge is to be found. In a typical formal curriculum, students are first paged with knowledge, and if they stick with something long enough (i.e., major in a discipline), they eventually get to the point of engaging in practice. Brown argues that people instead learn best by “practicing the content.” That is, we start in practice, and practice drives us to content. Or, more likely, the optimal way to learn is reciprocally or spirally between practice and content. Brown’s formulation echoes the growing body of inductive and inquiry-based learning research that has convincingly demonstrated increased learning gains, in certain well-designed conditions, when students are first “engaged with a challenge and then learn what they need to know to address the challenge.”

So, how do we reverse the flow, or flip the curriculum, to ensure that practice is emphasized at least as early in the curriculum as content?

Finally, this focus on practice changes what it means to teach, for both the faculty and an institution. How can an institution provide an instructional environment that makes this kind of learning possible and most effective, including (but not limited to) enabling the critical-expert roles that faculty play?

A Position of Authority
The entangled nature of practice and content is often expressed in the words of faculty who talk thoughtfully about their students’ learning, revealing how much higher-order knowledge is rooted in social and experiential learning. I recently ran a workshop called “The Bottlenecks and Thresholds Initiative,” in which we help faculty analyze their teaching by slowing down and thinking about what it is that a student needs to do well in order to be successful with complex tasks.

We were looking at a student’s general-education history paper, and I asked the faculty to say what the student needed to be doing well. After I pressed the group members, who wanted to focus on what the student seemed not to be doing well, one faculty member succinctly critiqued the paper’s weak introduction by stating that the student needed “to speak from a position of authority.”

Which department is responsible for teaching students how to speak from a position of authority? Where do we find evidence of someone learning to speak from a position of authority? Which assessment rubric do we use for that? Critical thinking? Oral and written communication? Integrative learning? Lifelong learning? Of course, when faculty speak of “authority” they mean not just volume, but the confidence that comes from critical thought and depth. Learning to “speak from a position of authority” is an idea rooted in expert practice. It is no more a “soft skill” than are the other dimensions of learning that we are coming to value explicitly and systematically as outcomes of higher education—dimensions such as making discerning judgments based on practical reasoning, acting reflectively, taking risks, engaging in civil if difficult discourse, and proceeding with confidence in the face of uncertainty.

Designing backward from those kinds of outcomes, we are compelled to imagine ways to ask students, early and often, to engage in the practice of thinking in a given domain, often in the context of messy problems. This is perhaps one way to rethink the role of technologies and social media tools—often the cause of that other type of teaching disruption—and reimagine the ways that discussion boards, wikis, blogs, Twitter, and collaborative writing tools and spaces might facilitate activities that help students learn to speak from a position of authority.

Derek Bruff, the Assistant Director at the Center for Teaching at Vanderbilt University, writes a blog, Agile Learning, about educational technology, visual thinking, student motivation, faculty development, social pedagogies, and many
other interesting pedagogical tactics. For one post, “Backchannel in Education: Nine Uses,” he talked about Cliff Atkinson’s book The Backchannel and adapted it to higher education. He listed nine ways that a faculty member could use Twitter in the classroom: notetaking, sharing resources, commenting, amplifying, asking questions, helping one another, offering suggestions, building community, and opening the classroom.

These are simple activities, but what do they look like if they’re part of the continuous flow of teaching someone how to move from novice to expert, tuned to disciplinary thinking or professional discourse? When we put Bruff’s excellent list into the intermediate space, what can we discover about how these means of engaging are serving as a bridge from novice process to expert practice? What is the relationship between the intermediate activity and the stages of intellectual development or the constituent skills and dispositions of a discipline? What if the activities enabled by social media tools are key to helping students learn how to speak with authority?

**Expanding Our Conception of Teaching**

If our concept of learning has outstripped our notion of teaching, how can we expand our notion of teaching—particularly from the perspective of instructional support and innovation?

**Team-Based Design**

One approach to expanding our conception of teaching is through what we might call “team-based design.” One version of this approach was successfully implemented by Patricia Iannuzzi, the dean of libraries at the University of Nevada–Las Vegas (previously at the University of California, Berkeley). She had long observed that the traditional “hub and spoke” model of course innovation was fundamentally broken. In the traditional model of course design, a well-meaning instructor seeking to make a change in a course talks separately with the teaching center staff, with the technology staff, with the librarians, and with the writing center folks. Then, when the course is implemented, the instructor alone deals with the students in the course—except that the students are often going back for help with assignments to the technology staff, to the librarians, and to the writing center folks (although usually different people who know nothing of the instructor’s original intent). So they are completing the cycle, but in a completely disconnected way. Iannuzzi’s team-based design thinks about all of these players from the beginning. One of the first changes in this model is that the instructor is no longer at the center. Instead, the
course and student learning are at the center, surrounded by all of these other players at the table.

The team-based model asks not only how all of these instructional experts might collaborate with faculty on a new design but also how some of them (e.g., embedded librarians) might play a role in the delivery of the course so that not all of the burden of the expanded instructional model falls on the instructor.

In a related example, Dan Bernstein, the director of the Center for Teaching Excellence at the University of Kansas, adapted Iannuzzi's model for a funded project to test the efficacy of team-designed courses, organized around a cognitive apprenticeship model, in improving undergraduate students' skills, with the larger goal of maximizing the effectiveness of each course for the wide range of students attending a state university. For example, library instruction and writing center colleagues worked with a psychology professor on designing staged research and writing assignments to scaffold a complex assignment involving intellectual synthesis and writing in a non-academic genre. In this large-enrollment class, high achievement on the final product went from 1 percent to nearly 50 percent of the class through iterative team design over four offerings of the course. The study concluded: "Our assessments of student learning as well as participating faculty members' reflections suggest that the team-design approach can be an effective and efficient way of supporting the development of undergraduate students' critical thinking and writing skills, even in large courses." A key aspect of the team-based design is the move beyond individualistic approaches to course innovation. In higher education, we have long invested in the notion that the way to innovate is by converting faculty. This move represents a shift in strategy; instead of trying to change faculty so that they might change their courses, this model focuses on changing course structures so that faculty will be empowered and supported in an expanded approach to teaching as a result of teaching these courses.

E-Portfolios and Systems Thinking

This holistic approach to rethinking strategic courses has a more macro counterpart in e-portfolios. As described above, e-portfolios can be powerful environments that facilitate or intensify the effect of high-impact practices. As tools of integration, they also help students make connections and think about how to present themselves, their work, and their learning to an audience.

The Connect to Learning (C2L) project (http://connections-community.org/c2l), a network of twenty-three colleges and universities for which I serve as a senior researcher, is studying e-portfolios and trying to formulate a research-based "national developmental model" for e-portfolios. One of our hypotheses is that for an e-portfolio initiative to thrive on a campus, it needs to address four levels: institutional needs and support (at the base level); programmatic connections (departmental and cross-campus,
such as the first-year experience; faculty and staff; and, of course, student learning and student success. In addition, e-portfolios on these four levels should be examined from four angles or sides: as a technology; as a means for outcome assessment; as an integrative social pedagogy; and through evaluation and strategic planning.

All four vectors are operative at all four levels, resulting in myriad combinations of what is required to run a successful e-portfolio project. E-portfolios, or Personal Learning Environments (PLEs), or whatever they are named—as something that enables students to weave those connections back and forth across the formal and experiential curricula—will be an essential element of our response to this disruptive moment. For any large-scale version of e-portfolios to be successful, they will require at the program and institutional level what Lamuzzi’s model requires at the course level: a goals-driven, systems-thinking approach that requires multiple players to execute successfully. All levels speak to the need to think beyond individual faculty and beyond individual courses and thus can succeed only through cooperation across boundaries.

**Connecting Ourselves**

As we move forward on our campuses, several strategies can help our notion of teaching keep pace with our expanding understanding of learning.

First, we need to acknowledge that the center of significant learning has shifted to a new, centered core that, from the perspective of deep learning and impact, most of the formal curriculum now must move from margin to center.

Second, we need to move beyond our old assumptions that it is primarily the students’ responsibility to integrate all the disparate parts of an undergraduate education. We must fully grasp that students will learn to integrate deeply and meaningfully only insofar as we design a curriculum that cultivates that; and designing such a curriculum requires that we similarly plan, strategize and execute integratively across the boundaries within our institutions.

Third, we need to think more about how to move beyond the individualistic faculty change model. We need to get involved in team-design and implementation models on our campuses, and we need to consider that doing so could fundamentally change the ways that the burdens of innovation are often placed solely on the shoulders of faculty (whose lives are largely already overdetermined) as well as how certain academic support staff (e.g., IT organizations, student affairs, librarians) think of their professional identities and their engagement with the “curriculum.”

Finally, we need to take the problem of learning in the post-course era very seriously. The learning we are coming to value most is not always where we are putting our greatest interest and effort in assessment, including the emerging discussions about “learning analytics.” To be sure, we should work very hard and carefully to align, document, and capture our current assessments of student learning; at the same time, we should be attentive and ambitious in figuring out how we want to cultivate and evaluate learning in this expansive environment.

**The New Nexus**

Steven Johnson, the author of the book *Where Good Ideas Come From*, closes his TED Talk of the same title with the tagline: “Chance favors the connected mind.” By “connected,” Johnson means two things, both of which bear on the problem of learning in higher education today. First, he means connected in the sense of being integrative, of making connections between things that seem dissimilar. And second, he means connected in the sense of being socially networked.

If we are beginning to see that the greatest impact on learning is in these boundary-crossing, integrative, and socially networked experiences, then we need to re-create dimensions of these experiences in the learning designs that bridge the classroom with life outside of it. The connection between integrative thinking, or experiential learning, and the social network, or participatory culture, is no longer peripheral to our enterprise but is the nexus that should guide and reshape our curricula in the current disruptive moment in higher education learning.

**Notes**

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10. This initiative (http://cadia.georgetown.edu/bottlenecks-and-thresholds/) builds on the work of David Paci and others on "instructional bottlenecks" and on Jan Meyer and Ray Land's work on threshold concepts.


12. See UNLV Faculty Institute on Research-Based Learning for High Impact Classes," http://www.library.unlv.edu/faculty/institute/.


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Randy Bass (basset@georgetown.edu) is Associate Provost and Executive Director of the Center for New Designs in Learning and Scholarship at Georgetown University.
The MIT Innovation Initiative: Sustaining and Extending a Legacy of Innovation

December 3, 2014

PRELIMINARY REPORT
EXECUTIVE SUMMARY

"MIT already anchors a remarkable hotbed of innovation.... With the right facilities, alliances, and programs, ... we can build on that lead and continue to serve as one of the most powerful engines of innovation ... in the world."
— MIT President Rafael Reif, Inaugural Address, September 21, 2012

Innovation — identified by MIT economist and Nobel laureate Robert Solow as “the driver of long-term, sustainable economic growth and prosperity” — has been a hallmark of the Massachusetts Institute of Technology since its inception. The initial vision of MIT’s founder, William Barton Rogers, was to foster an environment that would aid in “the advancement, development, and practical application of science in connection with arts, agriculture, manufactures, and commerce.” MIT has honored Rogers’ vision by attracting and educating exceptionally talented students, scholars, and researchers whose insight, creativity, and ingenuity have led to the people of MIT to develop groundbreaking concepts and products, from radar, GPS, the microchip, and inertial guidance for space travel to lasers, PET scans, and controlled-release drug delivery. These innovations have not merely influenced the economy and society; they have played an instrumental role in shaping the modern world.

What would Rogers make of the world 150 years after his vision was first articulated — a world both highly advanced in certain dimensions and exceptionally troubled in others? What can be asserted with confidence is that, more than perhaps any other institution, MIT has the capacity — and the responsibility — to carry the advancements of humanity forward and to devise imaginative and innovative solutions to its most daunting problems in areas like energy, climate, health care, education, food and water scarcity, and more. In this spirit, in the fall of 2013, MIT President Rafael Reif called for the creation of an MIT Innovation Initiative.

MIT will always be defined by its central focus on education and research. Yet more and more, innovation belongs to our mission as well. The following pages document the

MIT Innovation Initiative
origins and ambitions of the MIT Innovation Initiative—a new effort focused on providing a forum and framework for enhancing the Institute's innovation engine in ways that accelerate our community's ability to transform brilliant ideas and fundamental research into positive and substantive social and economic impact. Several critical factors are driving this effort.

*Our students are demanding it.* The focus of the Millennial Generation on leading lives motivated as much by social conscience as by personal gain has been well documented. At MIT, our students are demanding career preparation that positions them to make a positive difference early in their lives. They come here to learn the basic principles of science and engineering, and then build capabilities in innovation so they can go on to provide solutions that scale rapidly and achieve broad impact, whether through making and commercializing new discoveries, developing innovative businesses within global corporations, or launching new ventures. In fact, 20 percent of our incoming students expect to launch a company or nonprofit organization during their undergraduate years.

However, many MIT students report that they feel underprepared to transform their formidable discipline-based capabilities into high-impact innovations. If MIT is to continue to attract the world's most technically adept, ambitious, and creative students, we must enhance our academic offerings, co-curricular programs, infrastructure, and facilities to meet the demand for courses, spaces, social pursuits, and intellectual activities that nurture their innovative and entrepreneurial spirit.

*The innovation paradigm has shifted.* The image of the solitary scientist toiling for years in a corporate lab or the billion-dollar venture launched in a garage are no longer the only models. Rather, an increasingly hybridized model of innovation has emerged that requires complex physical, virtual, and computational resources, as well as access to diverse collaborators—from classmates and corporate executives to risk capitalists and stakeholders in communities around the world. Investing in these resources will help MIT accelerate the advent of innovations that can be developed and implemented at scale to deliver rapid and tangible real-world benefits.
The Initiative has broad support throughout the community. Enhancing MIT’s ability to deliver innovation requires more intentional integration of innovation-related activities already taking place on and beyond the campus, while also identifying new opportunities for promoting and accelerating innovation at the Institute. From the highest levels of the Institute and across all of its schools, there is broad support for this effort.

After conducting months of research (documented in this report) with input from stakeholders throughout MIT’s internal and external communities, the Advisory Committee outlined a set of priorities that will help MIT achieve its overarching goals around innovation by:

- Expanding MIT’s engagement around the world through education and research, so that we can understand critical problems more rapidly and build effective solutions that scale and achieve impact: focusing our attention on what we refer to as problem-rich and solution-rich environments
- Cultivating innovation communities that accelerate idea-to-impact activities – both on the MIT campus and around the world – in order to strengthen our connection to the full range of key stakeholders who enable the innovation economy
- Equipping the MIT community with the physical, digital, social, and cultural infrastructure – both on campus and around the world – to create solutions to 21st-century challenges with speed and focus
- Establishing and advancing the “science of innovation” (the systematic analysis of the factors shaping innovation outcomes) through fundamental research and policy advocacy with diverse stakeholders and thought leaders

A unified front – and a compelling case. By further unifying innovation-focused efforts across MIT’s five schools, streamlining processes along the idea-to-impact continuum, and establishing new facilities and activities in response to our community’s stated needs, the Innovation Initiative will support MIT’s commitment to taking ideas to impact. By enhancing MIT’s ability to deliver innovation faster and more effectively around the world, the Innovation Initiative aims to reimagine the role of academic institutions in the 21st-century innovation economy.

MIT Innovation Initiative
Our report comprises three main sections. "A Legacy of Transformation" traces the arc of innovation at MIT – from an early focus on manufacturing and industry, to technological innovations associated with the wartime effort of the 1940s, the advent of the digital age and the biotechnology revolution in the late 20th century, the emergence of social entrepreneurship at the beginning of this century, and the era of nanotechnology innovation now underway.

"Engaging the MIT Community" summarizes the findings from the extensive engagement effort that provided the foundations and inspiration for key priorities and activities associated with the Innovation Initiative. Coordinated through the Advisory Committee, which included representatives from all five of MIT’s schools and other senior faculty members, this effort drew from a previous assessment of MIT’s innovation-related capabilities conducted by the Boyce Committee for Innovation & Entrepreneurship.

"Accelerating Innovation" describes in detail the Initiative’s four primary areas of focus, per the Advisory Committee’s direction:

- Strengthening and expanding MIT’s innovation capabilities
- Cultivating communities that connect us across MIT as well as engage us with broader worldwide innovation needs
- Developing additional, transformative hands-on infrastructure
- Formalizing, studying, and promoting the science of innovation through our new Laboratory for Innovation Science and Policy

Reimagining MIT – and sharing it with the world. Through the Innovation Initiative, we aspire not only to affirm, re-envision, and rewire MIT’s approach to innovation, but also to do so in a way that can energize and empower the next generation of innovators well beyond the boundaries of MIT.

We welcome the thoughts of the MIT community on the framework and proposed scope of activities presented in this report. Over the coming months we will again be garnering
suggestions, particularly regarding how to prioritize and phase the report's many recommendations. Given the scope of its proposals (a finding of our work that speaks to the enthusiasm of our community for innovation, as well as education and research), we look forward to working with faculty, staff, and student leaders to develop more detailed plans for implementing various elements of the Initiative. Only with the engagement of the entire MIT community, as well as external stakeholders, can we collectively deliver on the promise of the MIT Innovation Initiative.

For their support and participation in the development of this preliminary report, we are indebted to President L. Rafael Reif, Provost Martin Schmidt, Sloan School of Management Dean David Schmittlein, and School of Engineering Dean Ian Waitz, as well as the Innovation Initiative Faculty Advisory Committee and Provost's Innovation Leadership Group.

Vladimir Bulović  
Co-Director MIT Innovation Initiative  
Associate Dean for Innovation  
Fariborz Maseeh (1990) Professor of Emerging Technology  
MacVicar Faculty Fellow

Fiona E. Murray  
Co-Director MIT Innovation Initiative  
Associate Dean for Innovation  
William Porter (1967) Professor of Entrepreneurship  
Faculty Director, Martin Trust Center for MIT Entrepreneurship  
Faculty Director, Legatum Center for Development and Entrepreneurship