

# Teagle Convening Faculty Work and Student Learning in the 21<sup>st</sup> Century

April 11-12, 2013

The core mission of the Teagle Foundation—to be “a catalyst for change” in order “to improve undergraduate student learning in the arts and sciences”—has been enacted in a series of grants over the years that have circled the issue, approaching it from different angles as the results of new work and developments in the field suggest the next questions that should be pursued.

Nine grants awarded in 2012-2013 were part of an initiative called “Student Learning and Faculty Work in the 21<sup>st</sup> Century.” The RFP for the initiative asked what the changing nature of liberal education—increasingly defined as the development of intellectual and personal capacities and increasingly shaped by a tough economic climate and by the continuous emergence of new online technologies—means for how colleges and universities and their faculties in the arts and sciences educate undergraduate students. In turn and more specifically, what do these forms of change mean for the nature of faculty work and professional responsibilities in the 21<sup>st</sup> century?

The grant program addressed several themes that have emerged from previous work and new developments in higher education: emerging insights from the cognitive sciences about how students learn, the widespread adoption of technology in undergraduate education, and the changing conditions of faculty life. These three themes formed the agenda of the April 2013 convening, designed to explore what grantees were learning from their projects, discern connections within and among those themes, and tease out their implications for the development of broad human capabilities in the 21<sup>st</sup> century.

## THE COGNITIVE NEUROSCIENCES AND STUDENT LEARNING

Chris Jernstedt, Professor *Emeritus* of Psychological and Brain Sciences at Dartmouth College, opened the meeting with an overview of what cognitive neuroscientists have learned about the nature, variety, and inner workings of learning that are most consequential to college-level teaching. An understanding of these discoveries can suggest how faculty might develop new strategies for teaching and learning and how institutions might support these efforts, including modifying faculty incentive systems.

*Insight #1: How memories are constructed.* The old model for the brain is captured in the metaphor of a warehouse where we store, and from where we can retrieve, literal information. But one of the most profound discoveries of modern neurological science is that rather than reflecting or containing a literal map of reality, our brain writes stories about it. Those stories are determined by innate brain structures and processes, age, experience, and personal and cultural circumstances. A better metaphor for memory is an archeological dig: in it we find fragments, and out of them we construct a memory.

*Insight #2: Where thinking happens.* Most of what we think goes on in our brain (95-98 percent) happens outside conscious awareness. When we put something aside and later have a “sudden” insight, we are likely to have been mulling the problem over in a pre-conscious way. This processing can happen in a number of different sites, because the brain is modular.

Students can acquire knowledge as effectively and more quickly from a transcript of a lecture than they do from attending the lecture. The key to real learning is to ask them to *do* something with the information. Although they have to do some metacognitive work while reading or listening, if you ask them to make an outline of the material or some other active processing of the material, they remember it much better.

We used to think that to learn, students must study lots—and if some study is good, more is better. But the correlation between learning and time spent studying is zero; the real correlation with learning is how students study. The most powerful thing we can do in helping students learn is to give them a question or a task—that is, ask for performance. Thus, the mantra of the National Center for Academic Transformation is, “students learn math by *doing* math.”

*Insight #3: What happens when we learn.* The new imaging technologies in neuroscience reveal that the brain is in constant flux, growing new neural pathways and eliminating others as new learning supplants the old. We do not forget just because of the passage of time, but because of interference from other learning and experiences during that time.

*Insight # 5: How skills and knowledge become transferrable.* To produce the long-term retention of skills, knowledge, and abilities, teachers need to give learners opportunities for repeated practice. If we provide 35 performance opportunities in 15 weeks, we can raise students’ scores by as much as 50 percentile points. Ideally, the tasks should be increasingly complex—e.g., a series of case studies, first describing simple situations, then complex ones, then complex ones with missing elements. By performing in varying contexts, students are better able to transfer skills and knowledge to a novel situation.

In testing students in this way, faculty need to provide evaluative feedback to minimize students’ retaining false answers. The most effective kind of feedback is not red marks all over papers but evaluative statements at the end of them. People do not process negative information well, so optimal feedback is positive; it tells students what they need to work on. It is also bi-directional, analytic, and predictive. Finally, it is episodic: do not always give it, or learners become dependent on it.

We used to talk about the assessment *of* learning. What would be more effective is assessing *for* learning. But it is most powerful and effective for us to understand “assessment *as* learning.” And the learning is bi-directional, since teachers too need feedback. For instance, they can improve their practice (e.g., better manage the proportion and sequence of classroom activities) by finding out what students are and are not “getting” (e.g., through the use of clickers).

*Insight # 4: Why we remember some things and not others.* The brain monitors not only what comes in but, via the emotional system, how we feel about it. Children are born loving to solve problems and get feedback, but that predilection, while high at birth, typically drops when they

go to school. One key to keeping it high is to make associations between the material to be learned and things that matter to learners, because the relevance of the content or skills signals to the brain that this is important material that needs to be stored in long-term memory.

This understanding has profound implications for teaching. For instance, Mark Carnes, Professor of History at Barnard College, presented “Reacting to the Past” as a pedagogy that makes use of this principle by having students assume roles informed by classic texts in the history of ideas, engage in in-depth research, and work in teams to engage in historical conflicts with opposing groups. Class sessions are run entirely by students; instructors advise and guide students and grade their oral and written work. This pedagogy draws students into the past, promotes engagement with big ideas, and improves intellectual and academic skills.

Student society has always contained competitive groups, and academe has historically privileged competition among individuals (e.g., via grading curves). But people of all ages do best in all subjects when they are cooperating within a group that may or may not be in competition with other groups. The students in Reacting courses are both creating a classroom culture of learning and trying to win in a game.

So how should higher education be restructured to make best use of these insights? We need to develop cultures and identities around cooperative learning. Jernstedt suggested that, at the institutional level, we backward engineer from what we hope students will know and be able to do at the end of their education, and then build as many models to accomplish this as are feasible and then test them. We need toolkits of sound cognitive neuroscience principles, he asserted, not recipes. Administrators need to support this work by creating an environment where such faculty work is encouraged, supported, carried out, and shared.

## ONLINE TEACHING AND STUDENT LEARNING

Larry Bacow, President *Emeritus* of Tufts University, keynoted the portion of the conference dedicated to technologically aided instruction, whether on campus or off. He noted that the earlier session on neuroscience and learning reflected the values of the participants: a deep interest in teaching and learning and a commitment to liberal arts education—a kind of education that currently seems under constant attack from the right and left. But, asserted Bacow, the initial discussion did not address a key challenge facing higher education today: cost control and reduction.

It is becoming increasingly clear that we cannot continue to raise the costs of higher education, thereby putting it increasingly out of economic reach for students. Increases in productivity are essential. Such increases are classically achieved by substituting either cheap labor for expensive labor or capital for labor. We have tried the former strategy by relying on larger and larger lecture courses and by substituting contingent for core faculty. Most of the participants would agree that these strategies have led to a diminution of “quality”—defined as the kind and amount of student learning generated.

The latter strategy, though, has gained considerable traction as colleges and universities substitute technology, with its low marginal costs, for labor. Bacow considers this movement to

be the first change in the production function of higher education in 1,000 years, enabling it to deliver high-quality content for low marginal costs. Such a use of technology, he asserted, produces demonstrably equal student performance and will continue to get better.

Bacow is convinced that traditional higher education will not disappear. He pointed out that most parents do not want their children to get an education sitting at their computers in the basement. School has always had a social function; there is a virtue in seeing people face to face (that is why we go to the symphony when we can download the same music for 99 cents). Content has always been available at low cost—for example, in libraries. Bacow sees Massive Open On-line Courses (MOOCs), the latest online development, evolving into textbooks—collections of digital materials, text, simulations, labs, and embedded lectures or snippets—that faculty will be able to slice and dice and make their own. But content does not equal an education.

That said, we still must articulate and document the unique contributions of the residential collegiate experience. That is where we inspire students, develop their general intellectual skills and values, and serve as role models. Campuses provide the space for students to learn to value diversity, to teach by helping other students, and to lead by participating in student organizations.

Nevertheless, online education is here to stay. In the fall, Peter Struck, Associate Professor of Classical Studies at the University of Pennsylvania, taught a MOOC with 56,000 enrolled students; Steve Zucker, Co-Dean of Art and History at the Kahn Academy, described the Academy's resources on art history, called Smarthistory, which will reach six million students in 20 countries—many, many more students than either teacher has reached in his entire career. So, as Struck suggested, MOOCs can help solve the worldwide collegiate access and cost problems.

Technology has a role on campus too. It's hard to find a course taught in the United States, Bacow pointed out, that does not have some technological element. Faculty will use it even more if it relieves them of the burden of grading. But will residential campuses use technology to reduce costs or only to enhance quality? We must use the new technologies to accomplish multiple goals: reduce costs, improve learning, and enhance the student experience, Bacow asserted.

Struck suggested that MOOCs are forcing the issue of the iron triangle of cost, access, and quality for all of higher education, including the in-class experience. MOOCs address the first two; the question remains whether they do the last—a question that only the assessment of learning will answer.

Some additional questions about technologically aided instruction remain:

- Are technologically enabled strategies such as MOOCs adequate for teaching, and if so, what subjects?
- How can we make them experiential?
- How do we handle the upfront costs of developing online courses?
- Will faculty become djs rather than divas—creating the environment for learning rather than doing star turns?
- How will they react to no longer being owners of their private courses but collaborators in a public space?

- How do we get these courses to students with modest backgrounds?
- What will this do to the very concept of a course/semester?
- What are the implications for faculty labor?
- What are the implications for credentialing?
- What are the implications for institutional culture and governance?
- How can leaders facilitate the changes that are coming?

## THE FUTURE OF THE PROFESSORIATE

The third major theme of the convening concerned faculty work and the future of the professoriate. Of the seven obstacles to the widespread adoption of online education enumerated in the Ithaka report<sup>1</sup>, six had to do with faculty attitudes. Technology is alien to most faculty; they fear that it will diminish their ranks (a realistic worry, if technology is used to lower costs), require a high time investment, and increase costs. Moreover, most faculty are reluctant to teach a course they do not “own” or a “programmed” course.

Moreover, there are also a number of structural impediments to a faculty’s focusing on teaching and learning *at all*. The first is cultural. Cathy Trower, Director of the Collaborative on Academic Careers in Higher Education, Graduate School of Education, Harvard University, began her presentation on the future of the professoriate by quoting a colleague, who said “I don’t teach students, I teach physics.” Faculty identity is generally more tied to disciplines than to institutions, and the focus within disciplines is on building a body of knowledge through research.

The second impediment is that since the 1970s, there has been a fundamental change in the nature of faculty appointments. Trower pointed out that between 1975 and 2009, there was a 41 percent decrease in the proportion of full-time tenured/tenure-track faculty (from 29 to 17 percent) while part-time faculty went from constituting 24 to 41 percent of the professoriate. Fully three-quarters of faculty are now off the tenure track (from 80 percent at community colleges to 40 percent at four-year liberal arts institutions).

Even though some faculty (especially women in the sciences with families) find the quality of life better off the tenure track, the current bifurcation of the faculty is troubling. Tenured faculty often want to confine their teaching to boutique courses to graduate students and to conduct the research that leads to rewards. More than 62 percent of departments reported that publication has become more important in tenure decisions over the last ten years in all fields. There is pressure for institutions to ascend in the prestige hierarchy and increase their research volume and the accompanying flow of dollars.

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<sup>1</sup> Lawrence S. Bacow, William G. Bowen, Kevin M. Guthrie, Kelly A. Lack, and Matthew P. Long, *Barriers to Adoption of Online Learning Systems in U.S. Higher Education*, Ithaka S+R Report, May 1, 2012, <http://www.sr.ithaka.org/research-publications/barriers-adoption-online-learning-systems-us-higher-education>

The ranking game is not the only culprit—the reward structure also reflects a product orientation. Faculty are rewarded for products (e.g., publications, grant funding) rather than processes (e.g., working with students). In the process orientation, students are viewed as partners in the scholarly enterprise; in the product orientation, they interfere with the “real work” of faculty.

The contingent faculty, meanwhile, do most of the teaching. And they do so under less-than-optimal conditions—among them, unsystematic and last-minute hiring; a lack of job security, with short contracts and a reluctance to rehire; little or no access to orientation, professional development, or mentoring; a lack of formal evaluation; limited opportunities for interaction with students outside of class; and little or no participation in curriculum development, department meetings, or planning and governance.

Research suggests that these poor working conditions have negative effects on student graduation, retention, transfer rates, GPAs, and major selection. They constrain the ability of contingent faculty to support an optimal student-learning environment, integrate innovative pedagogies, and provide personalized attention to students in need.

Given the forces at work, producing real and lasting change will be enormously difficult. Nevertheless, we know some things that we might do, acting collectively, if we have the will to do them.

*Strategies to support the work of contingent faculty:*

For greater student engagement

- Provide pay for office hours and allocate office space
- Offer professional development and training in the use of high-impact teaching strategies
- Change the procedures for evaluation
- Create mentorship opportunities

For an enhanced role in shaping the learning environment

- Require (and compensate faculty for) orientation
- Invite and facilitate participation in curriculum-development and planning meetings
- Create opportunities to participate in governance

For improving faculty retention

- Offer multi-year, renewable contracts
- Review salaries and benefits
- Study working conditions

*Strategies to support the work of tenure-track and tenured faculty*

For improving the environment:

- Change tenure and promotion policies to require that faculty engage with students in undergraduate research, achieve student learning gains, and mentor students—and then reward these efforts
- Redefine faculty workload policies and practices to reflect the time-intensive (but hidden) aspects of teaching, advising, and mentoring students

- Create multiple paths to success
- Reconsider the triple demands placed on tenure-track faculty

For stimulating the use of effective pedagogies and technologies:

- Provide seminars, workshops, and mentors
- Create an infrastructure that supports such work
- Showcase and reward success
- Remove barriers and provide time
- Encourage networking and the cross-fertilization of effective techniques

For improving faculty vitality

- Utilize mutual mentoring

*Unanswered questions*

- What is a meaningful faculty career?
- What is meaningful faculty work?
- How would we prepare doctoral students for it?
- How would we socialize new faculty?
- How would we organize it? Assess it?
- What type of employment system would we have?

## LEVERS FOR CHANGE

The convening's participants discussed how to enact the changes they see as necessary to introduce the discoveries of the learning sciences into teaching and learning, incorporate technology into undergraduate education, and support faculty in doing this work. Mary Deane Sorcinelli, Associate Provost for Faculty Development at the University of Massachusetts Amherst, enumerated the principles that guide her work:

- Faculty learn in community, and work in those communities leads to faculty leadership.
- Faculty are more likely to be convinced by rewards than by research-based evidence on how students learn. Fellowships and competitive grants are the coin of the realm, but ones aimed at improving teaching and learning need to be faculty driven and context sensitive.
- There should be no penalties for experimentation.
- Faculty learn when they have time. So what they need are easily adaptable strategies, release time or summer grants, student assistants, streamlined development opportunities, and sabbaticals.
- Faculty learn when they are supported and rewarded by leadership—symbolically and allocatively.

Many good strategies have emerged from the projects funded by the Teagle Foundation and represented at the convening. A sample of those that came up in discussion includes the following:

- Departmental rewards for learning improvement (University of Charleston). Making the awards at the departmental rather than the individual level establishes that teaching is a collaborative, non-private activity.
- Safe spaces (with food!) for faculty to talk about the risks of pilots (Cabrini College)
- Annual faculty retreats for the first-year program (Wagner)
- Highly selective teaching workshops (Associated Colleges of the South)
- Grants to faculty for the scholarship of teaching and learning (Kalamazoo)
- A freshman thematic focus for the year. Faculty work collectively to integrate their assignments and use common rubric across their courses (Dillard)

Some other strategies mentioned were hiring practices that make it clear that at this institution, faculty are not sole owners of their own classrooms; promotion and tenure criteria that recognize the scholarship of teaching and learning as genuine research; thematic freshmen learning communities that lead to student portfolios; and summer faculty development institutes sponsored by consortia.

### **INSTITUTIONAL INSIGHTS: SMALL GROUP DISCUSSIONS**

The final activity of the meeting was a gathering into small groups, each of which discussed one of the three themes of the conference: the insights of the cognitive sciences, teaching with technology, and the future of the professoriate. In that discussion, it became clear how interwoven these issues are.

The groups that discussed the cognitive science research and its applicability to faculty work stressed the importance of addressing faculty resistance and their fear that face-to-face instruction will be phased out. It has been said that “distance education begins in the fifth row,” and research has begun to establish that blended instruction is the most powerful pedagogical strategy. So face-to-face instruction, the most valuable thing liberal arts colleges have to offer, should be amplified by technology, not replaced by it.

Technology, carefully used, opens up new possibilities. Operating under the principle that learning should drive technology rather than the reverse, it can make the best teaching a public good because of the scale at which it can operate.

Many open questions remain. For instance, how will the adoption of online learning affect the cost curve of colleges and universities—and what effect will that in turn have on faculty employment and the future of liberal arts institutions? One participant noted that if liberal arts institutions are to survive, it will be because they are nodes in a local and global web—but how will they become that?

Online learning may also pose a threat to the hegemony of higher education in certifying learning. Even now, technology is leading to new forms of credentialing: certifications, badges, and micro-degrees. Could this alternative form of credentialing include or replace a college degree? If so, what would that mean for the integrity of a degree, which ideally represents a

coherent series of skills and a body of knowledge that is more than a collection of credits? We do not yet know how students' assemblage of online credits leads to a degree with integrity—a collegiate experience that promotes critical thinking, for instance.

It may be necessary to phase in technology, even as we create mechanisms to speed up the process. As the Great Generational Shift happens, institutions need to bring in people who are committed to teaching (which has implications for graduate training). As they do so, leaders need to pay close attention to how the new expectations they have of faculty affect their evaluations and their careers, as well as student and faculty culture. Then they should remove any barriers to the smooth adoption of new pedagogical strategies, such as an outdated reward system, and give the trailblazers public recognition.

Institutional leaders also need to recognize what it costs faculty to adopt new teaching strategies, both with and without technology—especially the risks they take within their disciplines, in the rankings systems, with accreditors and governmental actors, and with families and students. Such a shift also requires a huge investment of time—the time it takes to learn the new strategies and then use them successfully. Despite their sometimes remedial reputation, teaching and learning centers can help expedite this process.

And finally, language is important. It is telling that faculty talk about “teaching loads” and “my work.” Given the importance of their disciplinary calling for many faculty, institutions should be mindful about finding a balance between community and autonomy, even as they try to shift the focus to a shared responsibility for student learning. Although there are differences among the higher education sectors, it is important that faculty at all types of institutions have a variety of ways to contribute to the collective good, as well as the space for creativity and experimentation. After all, faculty not only care deeply about student learning—they are first and foremost learners themselves.