

Barriers to the Adoption of Online Learning Systems

Over the course of the last year, new models for online learning have captured the attention of the higher education community and the American public. In particular, “massively open online courses” (MOOCs) hold out the promise that tens of thousands of students can take courses online from elite universities for little or no charge. The implication in this proposition is that the online environment offers the possibility for a small number of faculty to teach thousands of students effectively. But up to now, that has not been the experience of postsecondary institutions delivering instruction online.

Online learning in various forms has been deployed in U.S. higher education for more than a decade, but most of these online courses are delivered much as classes have been delivered traditionally—with e-mail, online videos, and videoconferencing substituting for face-to-face class time and without taking full advantage of the potential added value of online environments. In general, faculty-student ratios for online courses have been roughly the same as those for traditional courses, with some faculty saying that teaching online actually takes more time than teaching face-to-face. Clearly, if the promises of MOOCs are to be realized, the technologies supporting these courses will have to shoulder a greater part of the instructional burden.

There are indeed new systems being developed in which instruction is delivered online and is largely machine-guided. The best of these systems rely on increasingly sophisticated forms of artificial intelligence, drawing on usage data collected from hundreds of thousands of students, to deliver customized instruction tailored to an individual student's specific needs—a technology often termed *adaptive*. We believe that there is potential for these more sophisticated adaptive systems to improve faculty productivity and lower instructional costs without sacrificing quality.

One year ago, several of us at ITHAKA set out to investigate the barriers to adoption of these more sophisticated, interactive online systems in U.S. higher education institutions. To distinguish these new systems from more general online learning environments, we coined a new term: *Interactive Learning Online*, or ILO. We interviewed presidents, provosts, deans, and other senior academic leaders at more than twenty-five institutions representing public and private research universities, four-year colleges, and community colleges. Our primary objective was to

identify what it would take to accelerate the effective uses of ILO systems in higher education.¹ As recent events at the University of Virginia demonstrate, even as these technologies show great potential, their successful implementation will require thoughtful leadership from senior administrators and trustees and effective collaboration with faculty.

Important Lessons Learned

Faculty want to maintain their sense of ownership in their students' learning experience. Faculty generally take great pride in determining the content for a particular course and the sequence and method by which the content will be taught. Although they are willing to borrow from others (and to share content they have created), they do not want to relinquish control over the process of course design. Faculty are therefore reluctant to embrace a course that does not allow for some degree of customization in how, what, and when relevant material is presented to their students. To understand the desire to customize, one need simply consider the market for textbooks for introductory subjects, as well as how faculty use such texts. Though some “standard” texts enjoy a significant market share, the textbook market is fragmented precisely because different authors and publishers are constantly trying to devise better ways to teach specific populations.

There do not yet exist sophisticated adaptive learning environments that offer faculty the ability to customize the learning experience for their students. Given faculty's desire to maintain ownership of the learning experience of their students, realizing gains in productivity will depend on the development of systems that allow the fundamental capabilities to be shared but that offer faculty the ability to exert a reasonable degree of pedagogical control. We do not yet see systems that offer this combination of a standardized infrastructure and a capacity to customize.

The development of such customized systems requires central coordination and substantial investment. Efforts at individual institutions to develop systems to support these new forms of online learning do not scale. Considerable venture capital is flowing into the development of these systems, mostly directed at K-12 learning and at offerings marketed directly to students. We believe that there is an important role for a national, system-wide effort, supported by either private philanthropy or governmental entities, to create sustainable platforms for ILO

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systems to serve higher education and, especially, large public universities.

Digital and network technologies are commoditizing some basic aspects of teaching while they are simultaneously unbundling various aspects of a faculty member's role. The best example of commoditization is the traditional lecture. Increasing numbers of professors are experimenting with “flipping the lecture”: allowing students to view the lecture online at home and saving class time for discussion and interaction. Some professors are capitalizing on video lectures delivered by other experts or on content that is openly available through initiatives like Khan Academy. The more general point is that the activities that have traditionally composed the faculty member's role are becoming unbundled. ILO systems, through their ability to offer customized learning experiences to individual students, represent an even more dramatic transformational force—one that can be regarded as either a threat or an opportunity. On the one hand, because ILO substitutes technology for some human instruction, it is threatening to faculty who value close contact with students. On the other hand, ILO can free faculty from the drudgery of certain aspects of traditional instruction (e.g., introductory lectures, grading, course administration) and allow them to use their time to interact with students in more rewarding ways—while generating productivity gains for the institution as a whole.

As the implementation of ILO systems begins, it will be extremely important to pay attention to the data collected from students using these systems. The ability to track the student experience through data generated by the online system is a valuable aspect of ILO environments, though one must also recognize the importance of maintaining students' privacy when using this data. Experienced online faculty welcome the ability to monitor students as they progress through a course, which can make it easier to intervene when students are not performing well. Over time, instructors will learn how to make better use of this information to improve the learning process by incorporating real-time assessment into their teaching. Perhaps even more powerful will be the analysis of the data at scale once ILO systems are widely adopted. “Learning analytics” is an important emerging field for both online and traditional education. Many colleges and universities are starting to mine the data generated by learning management systems to better understand who succeeds, who fails, and why. We believe that this data, if widely available, will become extraordinarily valuable to individual faculty members, curriculum designers, the academy, and society. To date, educational data of this kind has not been available for use by researchers, policy-makers, and others interested in improving learning outcomes. Accordingly, we believe it is absolutely essential that such data be easily obtainable by all those interested in how students learn and should not be privatized.

Resources saved or generated through existing online learning programs are not being used to lower institutional costs or decrease tuition. Using productivity gains from the deployment of ILO systems to lower costs and tuition will require strong leadership from presidents and senior administra-

tors. Among the institutions we studied, by far the most common rationale for offering online courses and degree programs is the desire to generate new revenue streams by reaching students who would not otherwise enroll in traditional degree programs. Very few institutions are using either the savings or the net incremental revenue from online education to reduce the price of education or to reduce the costs of instruction for traditional residential students. Likewise, very few are doing serious cost accounting to assess the efficiency of either their online or their traditional courses.

Conclusion

As the leaders of higher education contemplate the future of teaching and learning, the goal should not be to move instruction online simply because we can. Online education—especially highly interactive, machine-guided online instruction—is attractive precisely because it offers the tantalizing potential to improve learning outcomes while simultaneously bending the cost curve.

The upward spiral in tuition will end only if presidents, provosts, and trustees, working with faculty, make controlling costs a priority. Rather than merely looking for ways to enhance the undergraduate educational experience, academic leaders must also look explicitly for sustainable strategies to lower costs. They should commit in advance to splitting net savings with the faculty and applying the balance to lower tuition to students.

The challenges ahead are at least as much conceptual, organizational, and administrative as they are technical. The institutional structures within which the tools and technology are embedded require as much attention as, if not more attention than, the technology itself. The leaders of our colleges and universities need to embrace this transformational moment and guide their institutions to take advantage of this new technological environment. If they do not, and if higher education does not begin to stem the rising tide of college costs, our nation's higher education system risks losing the public support on which it so heavily depends. ■

Note

1. It is not possible to provide a comprehensive summary of our findings in this space. We encourage those who would like more information to read the entire report: 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>>.

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