

February 3, 2014

REPORT OF THE CORNELL DISTANCE LEARNING COMMITTEE

Executive Summary

At Cornell, as throughout the world, new developments in distance learning are generating much excitement. The recent rise of Massive Online Open Courses (MOOCs) is a prominent example. Cornell faculty in a number of fields report that a substantial online presence (not necessarily from MOOCs) is important for recruiting excellent students. Online courses can have an outreach or public relations goal, providing an avenue for broadly enriching society and promoting Cornell's reputation. They may provide a valuable service to students, offering a path to enhanced professional credentials (for example, via eCornell programs) or to academic credit (for example, in classes offered during Cornell summer and winter sessions). Because MOOCs have substantially lower per-attendee costs than traditional classroom teaching, some argue that a revolution in education has started, in which such online courses profoundly change how people learn.

While some are excited, others are skeptical about distance learning. MOOCs do not provide an educational experience that is equivalent to a traditional classroom. They are expensive to produce and maintain -- both in faculty and staff time. The models for deriving revenue that would sustain them are untested and could lead to undesirable changes in the higher education landscape.

In this document we explore these questions in detail. We conclude that we live in an exciting, if uncertain, time. We do not know the future of distance learning, but see that it holds much promise. Thus we recommend a broad approach: Cornell should pursue a diverse portfolio of distance learning avenues, continually rebalancing it as evidence emerges. We must be alert to over-stretching our resources. In particular we do not want our faculty making commitments that adversely impact on-campus teaching and research. As part of our commitment to

new opportunities, we should continue to nurture expertise in video/web production, as well as relevant pedagogy -- investments that also benefit on-campus teaching.

We emphasize the need for careful assessment of costs and benefits of specific endeavors. For example, we recommend that Cornell proceed strategically and carefully in considering whether to continue our commitment to edX beyond our two-year contract and, if that contract is extended, how many courses to offer per year. We also emphasize the importance of prudent educational policy (overseen by the faculty's Educational Policy Committee). For instance, we recognize the value of the credit given through Cornell's established online courses, but at this time recommend against giving Cornell credit for MOOCs. We provide discussion of the possible impact of licensing Cornell edX (CornellX) MOOCs for credit elsewhere, a topic that should play a role in future policy deliberations.

Throughout, our emphasis is on fruitful and diverse experimentation. In addition to targeted funding, this diversity is advanced by revenue sources and policies on copyright and conflict of commitment that encourage innovation. The many decisions needed to meet the challenge of this new frontier in education will require an organizational structure that enhances cooperation among administration, faculty and providers of technological and instructional support. We recommend a tripartite structure, consisting of a Distance Learning Committee, led by and mostly composed of faculty, a Distance Learning Administration Group, led by and largely composed of administrative leaders, and a Distance Learning Implementation Team of those designing and managing support. We will describe distinctive responsibilities of each group, how they will work together, and how they will interact with the larger Cornell community.

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I. Introduction: The Diversity of Distance Learning

Because of Cornell's land-grant mission, outreach to off-campus constituencies has been a part of our university education portfolio since its beginnings. At the turn of the millennium, the Board of Trustees incorporated eCornell, a wholly owned subsidiary, to take advantage of the electronic revolution in disseminating knowledge. In recent years, new possibilities for online distance learning have arisen that require scrutiny of novel prospects, pitfalls and costs, together with new plans and policies. In May 2013, the University Faculty Committee charged an ad-hoc Distance Learning Committee (DLC), with members appointed jointly by the Provost and the Dean of the University Faculty, to address these issues; the committee membership is listed at the report's end. Since then, we have met regularly as a committee of the whole, often discussing preliminary findings from five working groups. In this report we will present the outcome: our recommendations and their rationales, together with considerations and information that should guide the many other decisions about distance learning that lie ahead. Our effort here is merely a start.

The forms of distance learning are extremely diverse and continue to evolve. The purpose of this document is to help Cornell faculty, administration and staff navigate the numerous new creative possibilities. Cornell is already deeply involved in many forms of distance learning, and our Distance Learning Committee unanimously agrees that we should continue such a broad engagement while weighing the costs and benefits of future endeavors. To introduce our proposals about the future course of distance learning at Cornell, we will describe the major types of distance learning, whose approaches differ in expense and advantage, promise and pitfalls. The subsequent sections of this document will present our proposals about Cornell's response to the prospects of distance learning, addressing, in turn, the allocation of resources, benefits, certification and credentialing, the assessment and control of educational quality, administrative structures, and intellectual property.

Massive Open Online Courses (MOOCs) are free online courses that are accessed by a great many people (occasionally more than a hundred thousand). They are often treated as a single entity -- an object either of hope or fear -- while, in fact, various types differ greatly in format, intended audience, and cost of production and maintenance. One type has dominated recent public

discussions, and has been a recurrent topic in discussions of our committee, because of well-publicized claims concerning the transformative impact on American education of such MOOCs as well as their significant costs. These are courses offered through consortia, such as edX, Coursera and Udacity, aimed primarily at students in institutions of higher education or prospective students. These courses have high-quality production values, elaborate formatting and interactive segments meant to increase viewing and engagement. They have features that replace traditional student-instructor interactions: chat rooms and discussion boards substitute for discussion sections while grading by peers or computers allows online assignments to replace traditional assignments and exams. Because of these features, such courses can be offered for credit without further student-instructor interaction. The impact of such credentialing was considered in depth by the DLC, and will be discussed at length in this report. In addition to such exclusively online instruction, we will consider an alternative use: "hybrid" or "blended" learning, combining extensive use of online material with substantial face-to-face instruction, either interwoven or after the fact.

On May 21, 2013 a week after the DLC's first meeting, Provost W. Kent Fuchs announced that Cornell had signed a two-year contract with the edX MOOC consortium. Our university is committed to producing eight MOOCs, four in each of the academic years 2013-2014 and 2014-2015. This development highlights the circumstances under which this report was written: the field of distance learning and Cornell's understanding of its role were shifting quickly as our committee deliberated on the topic. So, edX MOOCs will be in the foreground when we consider this first form of distance learning. Where the context makes the limited extension clear, we will sometimes simply refer to online courses of this first form as "MOOCs."

Beyond these consortium MOOCs, several other types of online courses flourish. Many of these are free courses that large audiences view. For example, there are videos of lectures with little or no augmentation presented as Open Courses (for example, Open Yale Courses) by many universities. Among American institutions, MIT pioneered this in many technical fields, making materials for most of its undergraduate courses available during the last decade. There are also courses that have many of the features of consortium MOOCs, but are intended for people other than college or university students and those thinking of joining

their ranks. As an example, Cornell's NutritionWorks courses have provided professional development opportunities to thousands of nutrition and health professionals worldwide.

Going beyond MOOCs, some Cornell Summer and Winter Sessions courses represent yet another form of distance learning: online, but not accessible for free; meant to be taken at a distance for credit, but kept small (typically fifty students or less). Owing to their restricted enrollment, they allow for frequent interaction with instructors and other students via e-mail and discussion boards. Instructors in these courses grade student papers and provide individualized feedback (typically via email). Several professional master's degree programs blend online courses with concentrated on-campus stays. The professional development courses offered to human-resource managers through eCornell exemplify another variant. There, students pay tuition for access to the course, and then earn a certificate entirely through work online.

We take Cornell's extension and professional development online courses to be valuable, established aspects of distance learning at our university, and we have the same view of the online courses offered in the Summer and Winter Sessions and other programs of Continuing Education. Our limited discussion of these endeavors will reflect this endorsement. Indeed we will often derive lessons about productive practices from their successes.

Finally, distance learning can take place via "learning modules." Much shorter than full-fledged courses, they are meant for both online access by individuals and for application in courses that are largely face-to-face. These natural extensions of e-books, and natural contractions of online courses may or may not generate revenue for Cornell University. Other forms of distance learning, as well, may generate no or substantial revenue. The possibility of revenue raises questions, to be addressed below, concerning intellectual property rights and trade-offs between access and financial sustainability.

II. Resource Allocation

Our committee believes that Cornell's academic technology resources and targeted funding for distance learning should be diverse, including MOOCs, online courses that are not full MOOCs, interdisciplinary modules addressing broad public concerns, and disciplinary ones sharing advanced techniques and recent findings. Such diversity is consistent with Cornell's educational and outreach missions, insulates the university from rapid changes in the distance-learning landscape, and supports the autonomy of Cornell faculty. We enthusiastically endorse the current realignment of relevant facilities and expertise in the Academic Technology Center (ATC) of Cornell Information Technologies (CIT), which will facilitate this diversity and the innovations it requires. However, we understand that funds and staff have been recently re-directed within ATC and the Center for Teaching Excellence (CTE) in order to initiate the development of Cornell's inaugural edX MOOCs. Although these reallocations are understandable as a temporary measure, the important tasks of ATC and CTE within more traditional education cannot be neglected in the longer term. So the total resources of these groups may need to expand or Cornell support may need to be rebalanced. Moreover, we anticipate that additional support will be necessary for innovative distance-learning tools as the field matures. We regard the expanded activities of eCornell as usefully complementing ATC's current capabilities. In addition to whatever decisions are made about MOOCs, Cornell should maintain its development of other forms of distance learning.

These recommendations leave open many questions about relative emphasis in support of different types of distance learning and about the extent of Cornell's commitment of our limited resources to distance learning. For example, at what point do the costs in funds and teaching time of further edX MOOCs exceed the benefits? How should differences in disciplinary needs and opportunities affect targeted funding and new initiatives? How can access to forms of distance learning other than edX MOOCs be enhanced, and how should the search for sustaining revenue streams be viewed? We will offer relevant considerations, policy recommendations and policy choices when surveying potential costs and benefits associated with the exciting and expanding diversity of distance-learning prospects. We will present costs in a sub-section immediately below, to facilitate comparison; in the

following sections the discussion of benefits will be subdivided to allow more focused consideration.

Costs of Online Distance-learning Projects

When estimating the costs of different distance-learning projects, edX MOOCs are a natural benchmark, since they have a definite format and the largest costs (in terms of both time and money) of all the projects that we contemplate. The Academic Technology Center and eCornell provided estimates for the Tardos committee (Report to Provost W. Kent Fuchs on MOOCs, December 2012) of costs when creating an edX MOOC with the content and educational goals of a 12- to 14- week Cornell course, without enhancement by animations, diagrams, offsite video and the like. They did not include charges for facilities or equipment, or financial costs associated with faculty time. The median non-faculty labor bill, on the basis of the two budgets, would be about \$70K, ranging from \$50K to \$90K.¹ Costs could be much higher for more elaborate productions.

If this budget were used to price non-faculty production work for a learning module that is unenhanced by animations, diagrams and offsite video, with content equivalent to four 75-minute classes, the estimated price would be about \$15K. Other types of distance learning are less expensive. For example, hiring a VideoNote videographer to record a semester of a course costs \$5K (plus \$2.5K per semester to host the video in subsequent semesters; a simple outline of each lecture is also prepared). The university currently supports this option by offering a \$2.5K subsidy for twenty courses each semester. Panopto represents yet another tier of service. Cornell has purchased a license that allows instructors to record their courses without further charge. Panopto is a software service that records the instructor's computer screen synchronized with audio and video, without requiring a videographer or manual editing; its published pricelist cites an annual licensing charge between \$40K and \$60K for unlimited use by an institution of Cornell's size. Of

¹ These estimates of non-faculty labor costs are less than the funding allotted for production in recent Requests for Proposals because CIT's Academic Technology Center has supported production of the selected edX MOOCs without charging the full cost of its employees' services.

course, the production quality of less expensive videos is poorer, and this may reduce the extent to which the outcome is viewed. (These services are also used extensively by on-campus courses.)

The most important potential cost of distance learning is faculty time and the associated reduction of other faculty activities. The reduction sometimes corresponds to course relief, which can be essential as an incentive and as fair compensation. Such incentives can be disruptive for departments and/or require hiring additional instructors. Faculty time required for creating an edX MOOC is, in the

best current estimate, 200-300 hours (for example, 15-20 hours per week for 14 weeks). The subsequent administration of the course, involving online discussion forums, online instructors' responses to questions, grading and the like, is estimated to require more than ten hours a week. (At least one TA will also be required.) In many other forms of distance learning, the faculty time spent in production will be less, how much less depending on the ambitions of the project. Maintenance time after initial creation and launching is frequently negligible or nil. For example, posting an open course on iTunes U may entail no subsequent maintenance at all.

III. Benefits and Concerns

Audience Size

Consortium MOOCs, including edX MOOCs, have the potential to attract many enrollees, not just in the United States but worldwide (including developing countries). In a recent *Chronicle of Higher Education* survey, the median course enrollment was 33,000, indicating a broad interest in such courses.² It is this large audience that makes MOOCs potentially valuable: either as a revenue stream, an outreach/public relations venture, or a method of mass education. Moreover, in some disciplines, including computer science, statistics and engineering, such MOOCs are often assessed as valuable forms of instruction, especially in hybrid learning.³

One general concern in consortium-based MOOCs is the low completion rates, albeit in courses with remarkably large enrollments. In one recent study, the average completion rate was 6.8%, ranging from 0.8% in a Princeton "History of the World since 1300" course to 19.2%, for a course in computer programming from the École Polytechnique Fédérale de Lausanne.⁴ While

² See Steve Kolowich, "The Professors Who Make the MOOCs," *Chronicle of Higher Education*, 03/18/13, <http://chronicle.com/article/The-Professors-Behind-the-MOOC/137905/#id=overview>.

³ The impressive reports of the successful use of MOOCs that we have encountered have always involved their utilization in hybrid courses. For example, the widely reported outstanding success in using a MOOC of Buttushig, a high school student in Ulaanbattar, Mongolia, which led to his admission to MIT, resulted from the combination of an MIT edX MOOC in electrical engineering with intensive teaching of groups of two or three students every day for several hours by a Stanford computer science Ph.D. student with an undergraduate degree in electrical engineering. See Shipla Agrawal, "Bringing MIT Course Content to High School Students in Developing Countries," originally an edX blog, <http://www.dsruption.com/edx/a/50fd8c5a610257020000050>.

⁴ See "New Study of Low MOOC Completion Rates," *Times Higher Education*, 5/10/13. <http://www.insidehighered.com/news/2013/05/10/new-study-low-mooc-completion-rates>. A recent study of the University of Pennsylvania's sixteen Coursera courses found that, on average, 5% of those registering and 6% of those logging into a course at the start accessed the course

individuals' reasons must vary, these rates indicate that the vast majority of those who enroll in a MOOC do not find the benefits of completion sufficiently compelling to motivate their taking the whole course, even though they may acquire a certain experience or exposure that they find valuable. Another concern in assessing how well MOOCs attain the diverse goals of undergraduate instruction is the reportedly low proportion of students of undergraduate age taking courses. For example, University of Pennsylvania researchers have found that, of the 35,000 taking Penn MOOCs who responded to their survey, 83% had degrees already.⁵

While we are confident that the use of consortium MOOCs will have substantial benefits for students in appropriate disciplines (see below), we have serious uneasiness about the limitations of courses relying exclusively on online instruction via MOOCs. (These concerns are heightened by the likely role of such reliance in edX revenues, as discussed later.) In the only methodologically cogent study that we have discovered, investigators from Columbia University Teachers College found substantially lower student performance when exclusively online instruction was compared to face-to-face instruction at the community college level.⁶ Instructors at universities and colleges, both community colleges and four-year colleges, concur. In an extensive 2011 survey of chief academic officers, in which online instruction was sharply distinguished from hybrid instruction, only 32% agreed with the statement, "Faculty at my school accept the value and legitimacy of online education." On the whole, administrators did not share these faculty opinions. For example, two-thirds of chief academic officers assessed online instruction as superior to, or as good as, face-to-face teaching (nearly one-fifth said

in its final week. See Penn GSE Press Room, "Penn Study Shows MOOCs Have Relatively Few Active Users, With Only a Few Persisting to Course End", December 5, 2013, with associated PowerPoint,

<http://www.gse.upenn.edu/pressroom/press-releases/2013/12penn-gse-study-shows-moocs-hav-relatively-few-active-users-only-few-persisti>.

⁵ Ezekiel Emanuel, "On-line Education: MOOCs Taken by Educated Few," *Nature* **503**, 342. (11/21/13)

⁶ Community College Research Center, Columbia University Teachers College, "What We Know about Online Course Outcomes," April 2013, <http://www.achievingthdream.org/sites/default/files/resources/Online-Learning-Practitioner-Packet.pdf>.

"superior" or "somewhat superior"), while two-thirds (three-quarters of those in public institutions) agreed that "Online education is critical to the long-term strategy of my institution."⁷ In contrast to grounds for concern about courses that are exclusively or nearly exclusively online, there are more positive findings concerning hybrid courses. For example, an NSF-sponsored study of introductory mathematics and statistics courses at San Jose State University found improved scores but lower retention in a hybrid course in statistics.⁸

MOOCs in Different Disciplines

Consortium MOOCs in all disciplines provide educational benefits. Currently the extent of those benefits tends to vary among different disciplines, reflecting differences in educational practices, teaching goals, and relevant expertise. Computer science is a leading example of an area that is now highly receptive to teaching through MOOCs. Computer scientists are familiar with the technical tools for creating and maintaining online courses; the segmenting, feedback and testing in MOOCs lend themselves well to computer science instruction and are paralleled in on-campus teaching practices. Other areas in science, technology, engineering and mathematics are similarly well suited to MOOCs, as reflected in their frequently positive assessment among faculty in those fields. Elsewhere, especially in the humanities, learning goals and teaching practices do not as readily fit MOOCs in their current forms. Advanced undergraduate courses in the humanities place great emphasis on discussion among students and the instructor. Instructors' or TAs' comments on written assignments are vital at all levels. In both advanced undergraduate courses and many less advanced courses, emphasis is placed on an appreciation of the structure and internal progression of relatively long texts and on

⁷ Babson Survey Research Group, *Going the Distance: Online Education in the United States 2011*, pp. 7, 8, 13, 17, http://sloanconsortium.org/publications/survey/going_distance_2011

⁸ Carl Straumsheim, "The Full Report on the Udacity Experiment," *Inside Higher Ed*, September 12, 2013. William Bowen et al., "Interactive Learning Online at Public Universities," sr-ithaka-interactive-learning-online-at-public-universities.pdf, 2012, has pairings of hybrid and textbook-only statistics courses in seven departments in which the hybrid courses usually have better outcomes, but the other differences between the paired courses make it hard to draw further conclusions.

understanding and criticism of extended but unified arguments; these goals do not readily fit a format of brief segments with frequently interposed interactive devices. Thus it is unsurprising that many humanities professors do not think well of current consortium-based MOOCs with the typical goals of humanities courses, even though other online instruction is often well-regarded. It may be that the current challenges to humanities MOOCs will largely be overcome through an extensive re-conception of course design and creative use of new technology. Some of us regard this as a realistic prospect.

In these discussions we do not mean to endorse the purported sharp distinction between disciplines in which depth and reflectiveness are the terrain of humanities whereas science and engineering are simply a matter of rote learning of techniques. Within courses in the latter fields, as well (not to mention the social sciences), instruction in theories, controversies and explanatory frameworks may not always neatly fit current MOOC formats. Laboratory courses are even more problematic.

In our assessments of benefits and limitations of MOOCs, we recognize that this form of online distance learning, like all others, will continue to evolve. The allocation of resources should reflect the best current view of likely benefits and costs, including reduced resources for other forms of online learning and traditional instruction. It should also reflect appreciation of possibilities of improvement in new means of instruction that are in an early phase.

Use of Online Courses as Recruiting Tools

Some faculty on the committee report that free online courses are important for recruiting graduate students in their disciplines. High-quality online courses help to broadly advertise faculty and their research, and may lead to improved application rates. These outreach efforts strengthen visibility among peer departments, and may indirectly yield advantages even in recruiting top faculty.

Many different forms of distance-learning courses can fulfill this departmental recruiting goal. Initially, online courses were largely videotaped lectures and PowerPoint slides. In current practice, endeavors aimed at these benefits often have many or all of the features of consortium MOOCs, although these much more sophisticated online courses often are not designed for certification and for-credit licensing and may not be actively maintained by the instructor after the initial

offering. As with other forms of online instruction, their most effective use is probably in hybrid learning, in which the online course is combined with in-person instruction.

This recruiting goal may compete against some potential monetary revenue streams for online courses. For example, we cannot predict whether the use of a Cornell MOOC from the main edX platform in a for-credit course elsewhere would be acceptable to edX without a licensing fee. This might discourage the use of these courses, and reduce their impact on recruitment, especially in developing countries such as India.⁹

Regardless of their length, or how they are deployed, courses that are effective for recruiting are likely to be more specialized and to have smaller audiences than typical consortium MOOCs. Such ancillary benefits must be taken into account when deciding which distance education projects to support.

It is likely that these benefits will be highly discipline specific. The limitations of humanities instruction via consortium MOOCs and the frequently low regard for current offerings among humanities professors make it unlikely that consortium MOOCs in the humanities will attract outstanding graduate students. Other online options could, however, play this role.

Particular Considerations Regarding Learning Modules

In addition to full-length online courses, it is also worth considering the benefits from short learning modules. Interdisciplinary modules on issues of broad public interest can attract the larger public and could provide content for courses that is more attuned to current events than academic books, more richly informed and deeply thoughtful than journalism, and more accessible than academic articles. Disciplinary modules can furnish much-needed access to recent innovations and can offer evidence of the leading role of Cornell faculty. Both types of modules are tools for hybrid learning, combining online and in-person instruction, which may well prove to be the most effective use of distance-learning resources.

Interdisciplinary learning modules are also attractive as a means of combining the insights and intellectual presence

⁹ In addition to the full-fledged, high-production-value MOOCs presented on the edX.com site (those that we have described in the main text), edX also provides a technical platform for so-called "edX Edge" MOOCs, a further resource that might advance recruiting and other goals.

of internationally known academics with the contribution of Cornellians. The fact that the module was assembled as a Cornell initiative can be made very clear. Our university will have shown its leadership in responding to the special potential of distance learning. The expanded audience created by this heightened value will expand the reach for Cornell faculty participants. In general, we are confident that, with appropriate branding, all creative responses at Cornell to the potential of distance learning can add to Cornell's global presence. It is through such Cornell-identified additions to humanity's educational capacities that MOOCs and other forms of distance learning will represent distinctive Cornell resources.

Marketing of Other Distance-Learning Programs

EdX MOOCs are being, and presumably will continue to be, effectively marketed. Shorter offerings (including learning modules) have no such ready-made access portal at Cornell, i.e., no widely viewed site that people consult to find distance-learning resources of interest to them. With special exceptions (e.g., Summer Session, NutritionWorks, eCornell), the same is true of Cornell-originated online courses. The diversity and innovation that we support will only be meaningful if it leads to widespread use. Fortunately, considerable evidence exists that it is feasible to create a basis for this widespread use.¹⁰ Through effort and ingenuity, eCornell has created an extensive market for their online professional courses, which are available through a single portal. We recommend that Cornell consider developing its own portal providing information

¹⁰ This evidence includes the continuing success of the Great Courses/Learning Company series, the extensive viewing of several ensembles of open courses, such as Open Yale Courses, and the massive viewing of iTunes U, an access platform for offerings such as Open Yale Courses from our peer institutions and many others, which dwarfs today's MOOC consortia, with 300 million downloads per year of courses from over a thousand colleges and universities; the most popular courses have enrolled half a million. See Report of [Yale] Committee on Online Education, Yale News, December 19, 2012, p. 3. <http://news.yale.edu/2012/12/19/report-committee-online-education>; Sean Coughlan, "Open University's Record iTunes U Downloads," BBC News, October 3, 2011, <http://www.bbc.co.uk/news/education-15150319>; Jon Wiener, "Inside the Coursera Hype Machine," *The Nation*, November 4, 2013, <http://www.thenation.com/article/176036/inside-coursera-hype-machine#>.

about the entire suite of University's distance-learning activities. We envision this as a key task for the administrative structure described below. In general, we recommend an active, cooperative effort by the Cornell administration, interested faculty and academic technologists to seek enhanced means of access for learning modules and non-edX online courses.

Revenue

We recognize the importance of appropriate revenue sources in an ambitious, sustainable Cornell commitment to distance learning. We recommend cooperation among faculty, academic technology and the administration in identifying suitable resources.

The most traditional revenue stream, for example used by Cornell Summer Session, is tuition. Presently MOOCs at other institutions rely on different sources. For example, the course may be free, but one can pay for an ID-verified certificate of completion. MOOC consortia can also generate revenue by displaying advertisements. Some are beginning to license MOOCs to degree-granting institutions, either as stand-alone courses for credit, or as part of a blended-learning approach. Revenue might also be generated by selling the names of the most successful students as a way for companies to identify those most suited for certain jobs. It is noteworthy that eCornell, Cornell's solely owned company which charges a participant fee for its courses, has recently been returning funds (~\$1M annually) to the university which help to support online ventures.

Because of the scale of Cornell's current commitment to edX and the possibility of its expansion, the anticipated trajectory of revenue from edX is especially important. In the short term, we do not anticipate any income from any of Cornell's first round of MOOCs. Moreover, we estimate that if verified certificates of completion were offered, any fees would fall below the threshold required for edX to share revenue with Cornell. In the longer term, Anant Agrawal, edX's President, does not himself regard those current revenue sources as the basis for an adequate return on the huge investment in edX's infrastructure and individual courses. Rather, edX's ultimate revenue goal is a large flow of licensing fees from colleges and universities offering its MOOCs for credit.¹¹ This flow will presumably

reflect efforts to reduce expenditures by replacing face-to-face instruction with courses relying exclusively, or nearly exclusively, on online instruction. Perhaps Cornell would eventually benefit financially through its share of this revenue. But such a shift in the mode of instruction raises serious questions about educational benefit and loss, which we explore in the following section.

In addition to established revenue streams and the options that edX will provide, we posit that there may be room for the creative expansion of revenues, when Cornell modifies its approach to distance learning. Fees for instructional or personal use of a course, learning module or other means of distance learning might produce a revenue flow from a dedicated Cornell access platform. Perhaps selected parts could be available for free, with a fee for the full version. In one variant, Carnegie Mellon's highly successful Open Learning Initiative charges independent learners nothing for access, but gives no certification or credit, and charges a "maintenance fee" when instructors use their courses, in whole or part, as learning modules.¹² Firms that currently market online resources to university libraries on a subscription basis might extend this activity to Cornell-originated distance learning resources. We offer these merely as examples that should be explored with the central administration's help and support, and as evidence that movement beyond edX MOOCs does not require abandonment of long-term financial feasibility. Of course, revenue-yielding distance learning requires guidelines as to where the revenues would flow from a Cornell-supported project. These questions are addressed later in this report.

The Place of edX MOOCs at Cornell

The eight MOOCs that Cornell is committed to creating for edX over the next two years (i.e., by 1 July 2015) will have educational benefits, will expand Cornell's national and global presence, and will provide valuable experience in online instruction and assessment. At the same time, they have high costs, and other distance-learning options may yield a better return on investment. An important parameter is the amount of faculty time required to produce a MOOC, and the consequent reduction of time teaching local Cornell courses by these excellent instructors. Administrative structures must be put in place to manage such conflicting pressures. The current requests for proposals require

<http://chronicle.com/article/How-EdX-Plans-to-Earn-and/137433/>.

¹² See Carnegie Mellon Open Learning Initiative, <http://oli.cmu.edu/learn-with-oli/sign-in-to-your-class/>.

¹¹ See Steve Kolowich, "How edX Plans to Earn, and Share, Revenues from Its Free Online Course," *Chronicle of Higher Education*, 2/21/13,

department chairs to approve the professors' plans, in part so as to assure that other departmental teaching responsibilities will be fulfilled. Adequate control may be difficult yet important at the college level as well, where funding may originate. In colleges where teaching is especially MOOC-receptive, teaching could be diminished even if no one department is strained. Additionally, if MOOCs are derived from especially important and popular on-campus courses, tied to the talents and interests of the instructor, it may be hard to maintain the original courses while also running the MOOC and respecting the instructor's need for time on research and other tasks.

As the number of edX MOOCs increases, such problems are expected to become more serious, even if funding for development is spread among a variety of distance-learning

initiatives, as we recommend. Consequently, we recommend that Cornell should proceed strategically and carefully in considering whether, and at what rate, CornellX offerings should be increased beyond our current two-year commitment of eight courses. We have no collective opinion as to whether the edX contract should be continued, but are unanimous in agreeing that a definite judgment at this point would be premature.

Whatever the decision will be on this particular point, we are optimistic that Cornellians will lead in advancing the enormous potential of distance learning. We view the current expansion of distance-learning projects in Ithaca as positive, and believe that Cornell is appropriately building facilities and expertise for making future valuable contributions in distance learning.

IV. Certification and Credentialing

The topics of academic credit and certification are central to the discussion of MOOCs and online learning. Even if MOOCs are “open” now, funds to support platforms and production, and to pay for instructors’ time, will eventually have to be generated. Those monies will probably come from payment for academic credit (most likely from licensing fees paid by the institution granting the credit), continuing education credit, or verified certificates. The topic of credit for MOOCs raises complex questions, some of which involve troubling aspects of inequality in American higher education. In this section we discuss the various issues raised by credit/credentialing.

We recommend that Cornell University seriously consider placing restrictions on whether and how Cornell-sanctioned MOOCs may be used to generate revenue. In particular, there should be careful study of any revenue-generating model, taking into account the following considerations: Cornell’s mission as a land-grant institution, which suggests the need for affordable online educational programs offered as part of extension and other outreach activities; the social implications of the revenue stream; and the desire by some students to obtain a verified certificate and/or continuing professional education credit.

Cornell Credit

We advocate against granting academic credit in any Cornell degree program for MOOCs (i.e., entirely on-line courses with automated or peer assessment), including CornellX or Cornell-sanctioned MOOCs. Despite diligent searching, we have yet to find a MOOC that is equivalent to the level and rigor of an on-campus, for-credit Cornell course. Evidence presented in section II reinforces our concern, as educators, about the limitations of courses produced for massive online audiences and lost opportunities for personal interaction with faculty, teaching assistants and other students. In general, MOOCs differ significantly in quality, duration, and instructional level. Furthermore, there is no recognized source of assessments playing the role of the regional credentialing associations whose certifications of colleges and universities usually determine acceptance of courses for transfer credit.

This recommendation reflects our assessment of the current state of MOOCs. Evidence on the effectiveness of MOOCs is sorely deficient and thus should be a topic of continual investigation. As with all Cornell courses, the final decision

concerning academic credit at Cornell lies with the colleges’ and the faculty’s Educational Policy Committees.

We acknowledge that a MOOC can be an integral part of a Cornell-credit-worthy hybrid course, and that a MOOC could be productive in enabling AP-level skills. We encourage Cornell’s colleges and departments to examine—cautiously and rigorously—students’ individual experiences on a case-by-case basis in order to ascertain what, if any, credit should be given for online educational experiences. Even if they are inappropriate for Cornell credit, CornellX and other consortium-based MOOCs will enrich the lives of numerous individuals who are unable to take in-person courses on their topics comparable to Cornell’s, for reasons of money, locale, time or preparation.

Our recommendation that academic credit should not be given for MOOCs in Cornell degree programs is not intended to impose restrictions on Cornell’s current well-established credit-bearing online courses, such as those currently offered through the Cornell School of Continuing Education and Summer Sessions. For reasons presented in the previous section, we maintain that academic credit for these courses is appropriate and does not raise the same concerns as does credit for edX MOOCs. Indeed, we welcome Cornell’s continuing productive activities in this area.

Licensing of Cornell MOOCs for Credit at Other Institutions:

Our entire committee is wary about possible consequences of the licensing of MOOCs, including CornellX MOOCs, for the granting of credit at other institutions. We expect this will typically occur at two-year colleges and state college systems, largely as a way of managing costs and funding cuts through modes of instruction that are exclusively, or nearly exclusively, online. We are troubled by significant evidence that such instruction leads to less successful learning outcomes than in-person instruction, especially for students from low-income families, African-American students and students with generally low grades.¹³ We are also concerned with the impact on

¹³ See Community College Research Center, Columbia University Teachers College, "What We Know about Online Course Outcomes," April 2013, <http://www.achievethelearning.org/sites/default/files/resources/Online-Learning-Practitioner-Packet.pdf>; William Bowen et al., "Interactive Learning Online at Public

employment for faculty and graduate students. At the same time, we are aware that the cost-cutting strategies at other institutions are beyond Cornell's control and may necessarily play a role in a highly desirable expansion of American education. Furthermore, appropriately vetted MOOCs could, in principle, be used to extend or round out an institution's curriculum in a responsible manner.

A further complication is that MOOCs can be valuable in blended classrooms, where they act as sophisticated electronic textbooks to supplement in-person instruction. Licensing our courses for this purpose raises fewer issues, though there is no apparent bright line separating the two uses.

Our committee did not reach a consensus about how to respond to such licensing issues. At one extreme, at least one committee member maintained that we have no obligation, or ability, to police the uses of our intellectual property. We make no attempt to ensure that our textbooks are "used properly." At the other extreme, at least one member asserted that we should have a policy not to license any of our MOOCs for credit in any online-only format. Some others thought that licensing should be conditional on faculty approval at the institution granting the credit.

Given the absence of consensus on licensing for credit, it is important for the faculty as a whole to soon establish who has the responsibility to decide licensing issues. Should licensing be at the discretion of the instructor? Should Cornell University make this decision (either by fiat, or through some committee/administrative structure)? Regardless, when a faculty member produces a MOOC, she or he should know what their rights are in regard to licensing.

Other Credentialing

Many MOOCs presently charge for ID-verified "certificates of completion." Prices currently range from \$20 to \$100, and are the primary source of revenue for today's MOOCs. The market suggests there is a demand for this type of value-added certificate, which differs from academic credit. Our committee is comfortable with such certificates being available.

V. Quality and Quality Control

A number of aspects of educational quality have already been addressed because this is a crucial basis for allocating resources, assessing suitability for credit, and evaluating the social impact of distance-learning trends. In this section, we will consider how the quality of MOOCs and other distance-learning tools produced at Cornell can be assessed, improved, and monitored – once basic allocations and policies are decided.

Because MOOCs – whether Cornell-produced or external – are not currently considered to be for-credit Cornell courses, they need not conform to the relevant criteria for such credit. Still, faculty members should be responsible for the quality of their instruction in distance learning, as in the on-campus classroom, pursuing academic excellence of kinds appropriate to their educational project. They should assess the educational achievement of their students, seeking improvement and comparing costs and benefits. By their nature, MOOCs generate reams of useful statistics (enrollment, retention, completion rates and success/failure to understand specific concepts) that can be used for this task. While the format and features of effective MOOCs may vary from discipline to discipline, common features of educationally excellent MOOCs include well-articulated learning goals, meaningful feedback to student learners, provisions for student engagement, opportunities for students to ask questions and provide advice, productive use of assessment tools, and links to related learning resources. TA support can also be influential in developing and maintaining a successful MOOC. Similar considerations will be appropriate to other forms of distance learning as well.

The anticipated academic excellence of our university's MOOCs should serve to advance the Cornell "brand," which might be considered a further measure of quality. While excellence has priority here, outreach has significant value as well. Cornell's reputation would be enhanced by the global visibility of the University's online presence among students involved in distance learning; such visibility would expand and underscore Cornell's commitment to innovation and service to New York State, the United States and the world at large. MOOCs and other forms of distance learning can also help in the recruiting of undergraduate and graduate students. Anecdotal evidence from our College of Engineering, for example, claims that

potential applicants are attracted to schools that are active in MOOCs and other modes of online learning.

Controversial topics should not be avoided because of any feared impact on Cornell's reputation. To the contrary, informed, thoughtful inquiry into controversial public issues has been a part of Cornell's mission since its outset and has advanced our reputation as a top-tier university.

While the evaluation of success in distance learning courses requires different strategies than does assessment of on-campus courses, it is an essential aspect of the pursuit of excellence. For MOOCs, data about enrollment, retention and achievement are relevant. This information must also be treated with care, to avoid distorting reliance on readily collected numerical guides. Assessment by faculty not involved in a course's production, even including faculty from other universities, may provide appropriate feedback. Similarly, thoughtful student opinions can often be valuable guides for course improvement. If these faculty and at least some of these students are seen primarily as coaches, not judges, this will be an incentive to make good use of their insights and a basis for improvement in online teaching skills. Assessment activities can be developed through course analytics available through MOOC platforms. In general, online education provides many tools relevant to research-based pedagogy. In particular, attempts to employ statistical measures become more accurate with expanded sample sizes.

In addition to the need for care in finding effective and genuinely revealing means of assessing courses and instructors in distance learning, care and creativity will be critical in assessing student performance. Multiple-choice questions are the readily available technique, but they can be poor guides to student achievement. Other opportunities have been created or are under development in the online context. We encourage exploration of the most engaging and effective means of measuring student achievement.

Our approach to Cornell's online presence should include ways of leveraging distance-learning courses to improve on-campus teaching and learning. For example, learning modules can be included in the repertoire of course assignments, to support different learning styles, and can facilitate "flipped" classrooms, in which traditional lectures

are replaced by online instruction and the saved class-time is used for interactive learning. Faculty instructors of MOOCs can be supported in transferring skills and techniques developed in the online-learning context to their Cornell classrooms, and can serve as models for colleagues in such implementation of new pedagogical practices.

Because our goal must always be educational excellence, content is primary, but accessibility of content and interest in engaging with it are important, too. Here, technological quality plays an influential part, providing a medium that should support the content of the course. It would be false economy to neglect the technical quality of the digital content presented (video, images, audio, interactive components, etc.).

Accommodation of disabilities and sensitivity to economic and geographic barriers are other aspects of quality. The university must comply with the Americans with Disabilities Act. Additionally, the course and supporting materials should be available to students without

burdensome copyright restrictions or cost barriers. Effective use should not require especially expensive equipment or bandwidth. For certain online courses, we should consider accessibility to students in other countries who have language barriers and problematic Internet connectivity.

For the time being, the quality of CornellX MOOCs will depend on the quality of the edX consortium's course development tools: its platform's functionality, its technology's reliability, and edX's suitability to the ways in which Cornell faculty wish to pursue development of online courses. It will also be affected by non-technical features of the partnership: the willingness of edX to adjust its platform based on Cornell feedback, the stature, performance and track record of other edX partners, the developing reputation of edX as a successful MOOC alliance, and the level and type of communication between Cornell University, edX, and other edX partners. Continuation of our contract with edX must be judged in part on these bases.

VI. Administrative Structures

Due to the complexity of the emerging forms of distance learning, cooperation among faculty, administration, technology-support staff, outreach specialists, librarians, and legal counsel will be essential. We require an organizational structure that makes collaboration efficient, encourages deliberation about controversies, and helps us find new opportunities. Many important decisions, such as whether to renew the edX contract, will be made by the administration. Because of this, the organizational structure must guarantee an independent influential voice for the faculty and provide vehicles for ongoing cooperation, to assure that such decisions are well-informed and reached collaboratively.

In designing this organizational structure, we recognize the following: 1) The administration has ultimate fiduciary responsibility. Thus they will have decision-making authority concerning the selection and continuation of initiatives that utilize central funds and the facilities needed to provide university-wide support for online learning. 2) The faculty are stewards of educational policy. Thus faculty members should have the principal role in selecting particular courses and specific projects for targeted funding. Taking account of the established prerogatives of colleges, departments and standing professorial committees, the faculty should determine the process of oversight, monitoring and evaluation of distance learning; professors must wield the greatest influence when recommending policies and best practices to help distance learning advance Cornell's educational mission. 3) On issues of licensing and intellectual property rights, the administration, through the University Counsel and the Research Office, will ultimately rule on what current policies and contracts entail. 4) Major decisions regarding the scope of distance learning, the most promising directions of innovation, and future plans require joint action by the faculty and the administration following the deep involvement of those whose supportive facilities will be essential to the success of any plans.

These considerations lead us to recommend the following administrative structure: a faculty-centered Distance-Learning Committee, a Distance-Learning Administrative Group, and a Distance-Learning Implementation Team.

The majority of a newly formed **Distance-Learning Committee** (DLC) would be faculty, appointed by the Dean of the University Faculty, with advice from the

Nominations and Elections Committee. Administrators and academic support staff, appointed by the Provost, would complement the faculty. The Dean of the University Faculty, consulting with the Provost, would select this committee's chair. For example, we can imagine a thirteen-member committee: the Dean and the Associate Dean of the University Faculty, seven other professors selected by the Dean of the University Faculty, including the designated chair; together with four others: the Chief Information Officer, a librarian, someone from the Office of the University Counsel, and an additional member (for example, from the Center for Teaching Excellence) named by the Provost in consultation with the Dean of the University Faculty. While we offer this example purely for illustrative purposes, it is much like our committee and that has functioned well. We emphasize that this group should be a faculty committee having a faculty majority and a chair appointed by the Dean of the University Faculty. This will provide an effective, influential voice for faculty and, in appropriate areas, priority in decision-making.

The DLC will lead in the shaping of policies and best practices to advance the educational benefits of distance learning. In regard to this part of its charge, it will respect the prerogatives of colleges, departments and other teaching units involved in distance learning, relevant standing faculty committees, and the administration. When such action is compatible with these prerogatives, the DLC will establish new policies or descriptions of best practices, after appropriate consultation. In addition, the committee will determine the process of oversight, monitoring and evaluation of distance-learning efforts that spend central funds.

The DLC will also guide the selection of courses and projects for targeted funding. The committee will stipulate the criteria for selection, applying publicized guidelines and previously set strategic goals. It will appoint selection committees, which may have members from outside its own membership, to make final decisions in choosing specific courses or projects for focused funding.

The DLC will report annually to the Provost and the Faculty Senate on the state of distance learning at Cornell; it may recommend new or altered policies. This annual report will be accessible to the faculty and the general public. The group will consult with relevant standing faculty committees such as the Educational Policy

Committee and Faculty Advisory Board on Information Technology.

Finally, the DLC will provide advice to the Distance-Learning Administrative Group, and the latter will consult with the DLC. The DLC will provide advice on the selection and continuation of centrally funded opportunities, the designation of resources devoted to facilities that provide university-wide support for online learning, and decisions about the scope of distance learning, as well as the most promising directions of innovation and future plans.

The **Distance-Learning Administrative Group** would consist of members of the administration and leaders of technical support, appointed by the Provost, together with the Dean of the University Faculty (or a faculty representative appointed by that dean). It might have any of a variety of constituents and it likely will change internal structure as needs evolve. For example, a possible inaugural grouping might be: Provost, provost-appointed online-learning leader (for instance, a vice provost, associate vice provost, or provost fellow), Chief Information Officer, Dean of the University Faculty, and the director of eCornell.

The Distance-Learning Administrative Group would be charged to i) finalize decisions concerning the selection and

continuation of initiatives that use central funds; ii) allocate resources to facilities that provide university-wide support for online learning, and iii) determine the scope of distance learning, including the overall direction of innovation and future plans. In all of these areas, the group should actively consult with the faculty, giving a central role to the Distance-Learning Committee, such that, so far as possible, important decisions are made jointly. The Distance-Learning Administrative Group would also direct the activities of, and specify funding for, the Implementation Team.

The **Distance-Learning Implementation Team** is charged to design and actively manage the support for distance learning. This will include oversight of the services provided by the Academic Technology Center, the course design support from the Center for Teaching Excellence, and the access and copyright assistance of the University Library. This group will further seek to develop means to employ MOOCs and other forms of distance learning to advance on-campus teaching. The Implementation Team would report to the Administrative Group and be available for consultation by the DLC. The Administrative Group would choose its members and any chair. We anticipate that its specific membership, responsibilities and interactions with the administration will evolve as the particular needs of support for distance learning change.

VII. Policies Related to Intellectual Property and Faculty Prerogatives

The formats and uses of online instruction are rapidly changing. These developments will require continual adjustment of Cornell policies on intellectual property rights and faculty prerogatives. We welcome the administration's initiative to revise current policies in response to this challenge, and we appreciate its commitment to do so in active consultation with Cornell faculty. We also acknowledge that Cornell's current policies are less restrictive than those of some peers, and that this may be to our advantage in responding to distance learning opportunities. Finally we endorse the university's intention to institute practices that encourage creative experimentation in distance learning.

Guiding Principles

We agree with Cornell's guiding principle in devising policies and practices, aptly expressed in the opening sentence of the statement of principles governing current policies on inventions and related property rights: "Cornell University's primary obligation in conducting research and scholarly activities is the pursuit of knowledge for the benefit and use of society."¹⁴ In applying this overarching principle to distance learning, four considerations are noteworthy.

1. **Experimentation.** Cornell University should encourage the creative exploration of the many new forms of distance learning owing to their special promise.
2. **Cooperation.** Distance learning creates new possibilities for cooperation in education among faculty at different universities and colleges, enriching academic endeavors and benefiting society. Such collaboration should be promoted as valuable in itself, a means of enhancing appreciation of Cornell faculty insights, as well as a basis for reciprocation that will benefit the entire university.
3. **Sustainability.** Cornell should recoup enough of the expense of producing and maintaining distance-learning tools to prevent distance learning from being an excessive drain on other university priorities.
4. **Recognition.** Cornell's contributions to education should receive adequate recognition, nationally and globally.

¹⁴ *Policy 1.5: Inventions and Related Property Rights, Principles, Overview*, http://www.dfa.cornell.edu/dfa/cms/treasurer/policyoffice/policies/volumes/academic/upload/vol1_5.pdf

Although these general goals are all desirable, conflicts can arise among them. Policies that give faculty more rewards for their online endeavors (for example, by giving them larger fractions of revenue) or lower the burden (for example, by providing teaching relief to instructors of MOOCs) encourage experimentation, but this must be balanced against the goals of sustainability. Similarly, if Cornell colleagues were to routinely spend much of their time advising faculty at other universities, assisting in their research and improving their courses, net social benefits might occur. However these would come at an excessive cost to Cornell's stature and the sustainability of our own teaching and research.

Cornell's policies and practices concerning intellectual property rights and conflicts in commitment are, in effect, ways of balancing such sometimes competing goals without requiring continual adjudication, consultation and bureaucratic discretion. Our first recommendation (which we believe corresponds to current practice) is that experimentation and cooperation should be given higher weight than sustainability and recognition, in the context of our response to innovative developments in distance learning.

Ownership of Online Course Material

According to current policy, Cornell professors typically own the copyright to the course materials that they have created. There are, however, exceptions: Materials produced under a specific contract that vests rights elsewhere do not belong to the professor. In the distance-learning context, the edX contract plays this role. University policy also includes a general exception, stipulating Cornell copyright ownership when encoded works (i.e., software and other digitally encoded information sources) are "developed with the 'Substantial Use' of University resources, funds, space, or facilities ... in the University. For purposes of this Policy, University resources include grants, contracts or awards made to the University by extramural sponsors. The use of University resources is 'Substantial' when it entails the use of University resources not ordinarily used by, or available to all, or virtually all, members of the faculty."¹⁵

¹⁵ See "Cornell University Copyright Policy," adopted by the Cornell University Board of Trustees Executive

Our committee believes that our distance-learning goals will be advanced by continuing to interpret the final sentence in a way that does not impose stringent requirements on faculty engaged in online innovation. Such an interpretation encourages experimentation during this era when distance learning and corresponding university support are both evolving swiftly. For example, Cornell resources today may not allow the use of skilled AT videographers by virtually all members of the faculty. But a faculty member with good reasons to seek the limited use of this resource for a learning module might worry that the module's free availability to colleagues elsewhere could be constrained by the policy. We would like to avoid the consequent stifling of creative distance-learning projects. On the other hand, many of those on our committee would argue that course relief is 'substantial,' and it is appropriate for Cornell to maintain control of material whose production was made possible by teaching relief.

In general, when an online project is relatively small, we hope that these considerations allow for faculty ownership and broad faculty prerogatives.

Division of Revenue

Our understanding of present Cornell policy leaves open many questions as to how the university should exercise its prerogatives, especially in the division of revenues. Currently, practices in dividing revenues are varied and evolving. For instance, in the case of edX MOOCs, revenues derived from collaboration with edX are to be put back into development of further MOOCs while revenues derived from subsequent uses of an already-given edX MOOC's content outside of edX are to be divided 50/50 between Cornell and the faculty participants. By contrast, for patents, a three-way split occurs between the central administration, the faculty inventors and the academic units sustaining their activities. This is an area for ongoing discussion and consultation. The competing interests to be weighed are: (1) The university's investments in funds, facilities and course relief and (2) the extraordinary time and effort invested by the faculty. This policy structure shapes the incentives for engaging in distance-learning projects, and may even influence what projects are possible. For example, revenue sharing might be a necessary enticement for a collaborative venture with

faculty outside of Cornell. It will not be easy to find the right balance.

Conflicts of Interest and Commitments

As with copyright policy, current University policies on conflicts of interest and commitment also raise concerns about thresholds governed by the term 'substantial.' In particular, current policy stipulates that "where a faculty member teaches a course or otherwise makes a substantial contribution to the instruction or educational services offered by another entity" they need to have the potential conflicts of interest or commitment reviewed prior to it being undertaken. Many members of our committee are concerned that if the bar for "substantial" is set too low, then an undue bureaucratic burden will be placed on faculty. For example, is a review necessary before a faculty member presents her views in a 20-minute video clip that plays a crucial role in a learning module at another university? We recommend following current practice, where such a case would not require review.

Summary of Policy Issues

Copyright and conflicts policies are works in progress, whose development needs to take into account the rapidly shifting online-learning landscape. We appreciate the administration's flexibility when developing policies and its willingness to share revenues, both in interpreting the threshold for University property rights and in exercising those rights. These attitudes should significantly advance Cornell's educational mission by promoting progress in distance learning.

VIII. Conclusion and Major Recommendations

The distance-learning landscape has changed substantially during the eight months over which this report was written. The only adequate response to such rapid changes, and the similarly fast evolution of the relevant technology and the field, is broad and open experimentation. Our investigations and discussions have convinced us that online education will be influential in the future educational scene but almost certainly not in the form that we see today.

We now summarize this report's recommendations.

Support diverse distance learning projects

Cornell's academic technology resources, course design support, and targeted funding for distance learning should be diverse and flexible, including MOOCs, online courses that are not full MOOCs, interdisciplinary modules addressing broad public concerns, and disciplinary modules sharing advanced techniques and recent findings. We endorse the expansion of relevant facilities and expertise in the Academic Technology Center of Cornell Information Technologies, and the newly dedicated support teams within the Center for Teach Excellence, which will facilitate this diversity and the innovations it requires. In this expansion, support for edX MOOC production by Cornell ought to be balanced against pressing needs for other promising forms of distance learning as well as online help in classroom teaching. This may require a rebalancing of current allocations.

Proceed carefully and strategically with considering further EdX commitments

Taking account of benefits, alternatives, and costs (especially in faculty time commitment), Cornell should proceed strategically and carefully in considering whether to continue our commitment to edX beyond our current two-year contract and, if so, how many courses to have.

Do not award credit for MOOCs at Cornell

We advocate against granting academic credit in any Cornell degree program for any MOOC (i.e., an entirely on-line course with automated or peer assessment), including CornellX or Cornell-sanctioned MOOCs. In contrast, no restrictions (beyond the current approval requirements) should be imposed on Cornell's well-

established bases for credit from our own online courses; the latter include university-sanctioned distance-learning courses for professional education credit (e.g., for health professionals) and courses offered by the Cornell School of Continuing Education and Summer Sessions. We welcome the University's continuing productive activities in these areas.

Carefully weigh impacts of licensing MOOCs

We are wary about possible consequences of the licensing of MOOCs, including CornellX MOOCs, for the granting of credit at other institutions. We are troubled by evidence that such instruction provides for less successful learning outcomes than in-person instruction, especially for under-resourced students. We are also concerned with the impact on faculty and graduate students. At the same time, we are aware of the need to educate more students at lower cost: Licensing Cornell MOOCs could play a role in a highly desirable expansion of American education. In light of these competing concerns, we were unable to form a consensus about what restrictions, if any, Cornell or Cornell faculty should impose in response to such licensing issues. Regardless, when a faculty member produces a MOOC, she or he should know their rights in regard to licensing.

Expand access and revenue

Our enthusiasm about the promise of distance learning and the need for diversity and experimentation leads us to recommend innovative efforts to improve access and generate revenue, in addition to diverse targeted support. Cornell should consider developing its own portal providing information about the entire suite of the University's distance-learning activities. We recommend an active, cooperative effort by the Cornell administration, interested faculty and academic technologists to seek enhanced means of access for learning modules and non-edX online courses. Opportunities may be available for creative expansion of revenues as well, through innovations in which cooperation between faculty and the administration will be essential.

Pursue high quality projects

Cornell should pursue high-quality distance-learning projects, which empower diverse students in meeting their learning goals. This process should take advantage of

opportunities for data-gathering online, without over-emphasizing quantitative measures. The focus should be on helping faculty improve their online teaching and on guiding the productive allocation of online resources. Lessons learned about distance learning should be extended to enrich the teaching of on-campus courses at Cornell.

Create collaborative organizational structure

In realizing the University's potential in distance learning, cooperation among faculty, administration, technology-support staff, outreach specialists, librarians and legal counsel will require an organizational structure that makes collaboration efficient while assigning responsibilities on the basis of expertise and appropriate prerogatives. We recommend a tripartite administrative structure, consisting of a faculty-centered Distance-Learning Committee, a Distance-Learning Administrative Group, and a Distance-Learning Implementation Team. The Distance-Learning Committee, mainly faculty members and chaired by one, will lead in the shaping of policies and best practices to advance the educational benefits of distance learning. The DLC will also guide the selection of courses and projects for targeted funding. The Distance-Learning Administrative Group would consist of members of the administration, leaders of technical support and the Dean of the University Faculty. They would finalize decisions concerning the selection and continuation of initiatives that use central funds; allocate resources to facilities that

provide university-wide support for online learning, and determine the scope of distance learning, including the overall direction of innovation and future plans. The Distance-Learning Implementation Team would be charged to design and actively manage support for distance learning.

Interpret policies in ways that enhance innovative distance learning

Because the formats, uses and means of producing online instruction differ in notable ways from traditional classroom activities and are all changing, they will require continual adjustment of contemporary Cornell policies about intellectual property rights and faculty prerogatives. We welcome the administration's initiative to revise current policies, and its commitment to actively consult with Cornell faculty on these matters. The official thresholds for University ownership and faculty commitment, which partly involve judgments of what constitutes "substantial use" of University resources, should be interpreted in a way that provides a supportive context for ongoing experimentation. Revenue arrangements should provide adequate incentives and compensation for faculty commitment of time and energy to demanding, unpredictable projects.

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