Overview

The Presidential Advisory Committee on Technology in Higher Education was appointed in February 2012. The committee was asked to “provide guidance to the university and its leadership in the areas of educational technology and its use both on-campus and off.” The wide scope of the Committee Charge from President Hennessy includes “policy and strategy for using technology to enhance learning for matriculated graduate and undergraduate students, for executive education programs, for new educational models that may combine distance and on-campus education, and for remote, online education that may serve students not enrolled in normal degree programs.” As anticipated in the February charge, the nature and scope of discussion across campus changed over time and the committee chose to explore broader questions raised by faculty and by University leadership.

The committee met bi-weekly from early March until June and produced this interim informal report, as requested in the charge to the committee. The three-page Committee Charge poses twelve questions that may be grouped into three topic areas:

- **University ownership and faculty policy** (Question 7): How should University ownership rights be clarified to protect Stanford’s interests and to provide appropriate opportunities and rewards to faculty?

- **Content production** (Questions 8-12): How should Stanford support development of educational technology and course content through University resources, on-campus support organizations, and faculty incentives?

- **Content delivery** (Questions 1-6): Which delivery platforms should be considered and which contract terms are appropriate with any external content-hosting organization? What branding options, data collection, and continuing relationships with non-Stanford students should be considered?

As the committee began deliberation, it became clear that we could not address these questions effectively without asking broader questions about the University’s mission and goals. The Committee Charge asks about broad external delivery (Question 6), possibly through an outside commercial provider (Questions 1-3), with some form of certification (Question 5). Based on discussions with Ram
Shriram of the Board of Trustees and input from the president and provost, the committee devoted its initial meetings to broader questions about the likely progress of online education and its potentially disruptive effect on the academic enterprise. Accordingly, this report addresses four topics: University goals and the three topics listed above.

While the committee did not have sufficient time to outline a roadmap, it did reach a better understanding of the landscape, achieve consensus on the importance of branding, and evolve from a focus on widespread delivery at low unit cost to a more balanced approach emphasizing on-campus innovation in combination with programs leveraging external delivery, possible licensing of course material to other colleges and universities, and external delivery of non-credit offerings conceptually evolving from our current iTunes U and YouTube programs.

The committee suggests that Stanford continue to experiment with a wide range of exploratory course models and delivery options. At the same time, we envision a longer-term strategy that explores and evaluates three distinct approaches for distinct purposes: (i) Stanford programs serving admitted students who meet appropriate admissions criteria, (ii) potential licensing of course material to other non-profit colleges and universities in some form, and (iii) external free or low-cost delivery without student certification to promote one of the historic functions of universities – the dissemination of knowledge – while also enhancing faculty visibility, broadening our impact, and reflecting Stanford’s leadership in online education. There are also opportunities to strengthen ties to alumni, academically prepare potential college applicants, and reach other deserving groups through online programs.

The committee is chaired by John Mitchell (Computer Science and Special Assistant to the President for Educational Technology), joined by faculty Peter DeMarzoo (GSB), Harry Elam (VPUE), Bernd Girod (EE), Larry Kramer (Dean, Law), Rafe Mazzeo (Math), Jim Plummer (Dean, Engineering), Charles Prober (Sr. Assoc. Dean, Medicine), Garth Saloner (Dean, GSB), and Dan Schwartz (Education). The committee includes ex officio members Charlie Junkerman (Continuing Studies) and Paul Marca (Stanford Center for Professional Development) and is supported by Roberta Katz (President’s Office) and Megan Pierson (Provost’s Office). Ram Shriram (Board of Trustees) attended and contributed to the committee discussion. As Amy Collier (Associate Director for Technology and Teaching, CTL), Dave Olson (GSB alum), and Jane Manning (content development) expanded their on-campus outreach and support efforts for technology in education, each attended committee meetings as guests.

University goals and perspective
New technology and new teaching models promise to redefine and transform higher education. Prior to 2010, Stanford had successful online efforts, including those associated with the Stanford Center for Professional Development (SCPD), Stanford on iTunes U, Stanford on YouTube, the Stanford Technology Venture Program’s eCorner, and the Stanford Online High School (see www.stanford.edu/online). Following successful on-campus experiments in 2010 and 2011, three online courses developed by Stanford faculty were offered to the world free of charge in autumn 2011. Approximately 350,000 people registered interest in these three courses and tens of thousands completed video lectures and automatically graded online exercises. Subsequently, two Stanford faculty startups, a Harvard-MIT
collaboration, and new for-profit universities have each raised tens of millions of investment dollars and begun operation. Faculty reaction has ranged from enthusiastic efforts to produce additional free online classes to concern about the future of academic institutions and debate about the relative merits of online and traditional teaching.

A number of analyses have appeared in the press and online over the past year. One common belief is that the expansion of online learning will disrupt the existing landscape of educational institutions. Online education may not initially compete with established institutions such as Stanford, Harvard, Yale, or MIT, but it will offer online learning experiences to people who currently have little or no access to elite higher education or, for that matter, any higher education at all. Over time, the quality of online learning is likely to improve. As a result, online offerings may come to compete with many established institutions of higher education.

**Mission.** The committee recognizes that Stanford’s primary educational mission is to teach selected students who apply to our programs and meet our admissions criteria. At the same time, the committee believes that it is in the University’s interest to achieve broad impact through external distribution of courses. As a leading educational institution, we have an opportunity to serve the public good. If carried out effectively, external distribution will also enhance the reputation of individual faculty and the institution as a whole.

**Overlap between on-campus and off-campus innovation.** There are many ways that Stanford may approach online education, both on-campus and off-campus. Indeed it seems likely that different schools within the University may follow different strategies. Regardless of possible future strategic decisions, however, it is evident that we must forge ahead to understand, master, and leverage new educational options. We cannot truly understand the opportunities before us, nor prepare to take advantage of them, unless we experiment with new learning models and the technologies required to support them. To give one example, experiments with the flipped classroom have shown promise on-campus and suggest one strategy for off-campus delivery. In this model, traditional lecture material is moved to “homework,” in the form of interactive videos, and “homework”-style exercises are moved to the classroom in the form of interactive activities. For off-campus delivery of an entire class, the interactive sessions could be carried out using various web technologies ranging from instructor-staffed web meetings to asynchronous group collaboration.

Turning to current technology, classroom experiments on campus and free online classes delivered off campus combine four basic components in varying ways:

- **Interactive video,** often structured into short segments (typically 10-15 minutes). Interaction stems from embedded questions or online exercises that engage the student and confirm understanding.
- **Automated assessment,** which involves more extensive exercises separate from instruction.
- **Social networking,** in the form of an online discussion forum for students and instructors.
• **Collaboration software** supporting student group projects, peer assessment, and cross-group interaction.

Among other developments that might occur, we expect that as online courses expand to a broader range of academic areas, different courses may experiment with different uses of these components. In particular, while automated assessment is practical for, say, computer programming, because student programs can be run and their output evaluated, automated assessment is more difficult for subjects in the humanities and social sciences. However, the potential exists for creative use of class participants to provide feedback, or perhaps such areas will simply require greater human instructor input to be effective in a college curriculum.

**Online courses for off-campus participants.** The committee considered a number of possible scenarios for engaging a broader learning community through online courses, including hybrid on-campus programs and MOOCs (massive open online courses). While enthusiastic about the educational impact of public online distribution, the committee noted some potential consequences of widespread distribution through a third-party-branded distribution channel, or **content aggregator**.

• **Content aggregation.** In other markets that have been transformed by online delivery of digital media, content aggregators have been able to exert control over content producers. This can be seen in the evolution of the newspaper industry, the music industry, and the textbook industry. For the expanding online education market, relatively high-quality content could become a commodity because many colleges and universities could offer content free of charge. For-profit content aggregators may seek monetization through value-added services such as credentialing or job placement for very large numbers of students. The committee believes that Stanford should seek to distinguish Stanford courses and programs from low-priced commodity content that may become plentiful. In other words, Stanford should chart a course of action that distinguishes itself above and beyond a simple provider of content to third-party aggregators.

• **High-quality vs low-price/high volume.** Stanford is recognized as a leading educational institution. In any number of markets, history has shown that high-quality brands may remain viable in the face of market upheaval introduced by low-priced, high volume competition. As a market is transformed, however, products that are distinguished neither by high quality nor low price may suffer. Based on these fundamental considerations, the committee believes that Stanford should remain focused on maintaining its reputation for high-quality education.

**Possible strategies.** One way to leverage Stanford’s strength as a recognized traditional university is through expanded online programs that offer Stanford-branded degrees or certificates to applicants meeting stringent admissions criteria. Because admissions criteria inherently limit the number of participants, such programs would not reach as broad an audience as MOOCs. However, they could expand our core student body through hybrid offerings, provide flexibility for more Stanford students to study overseas, and provide new educational opportunities for professionals entering graduate programs. It may also be possible to develop new programs for specific groups, such as Stanford alumni. A feature of hybrid programs, which allow some online students to participate in on-campus activities,
that the campus activities immediately distinguish Stanford programs from those of strictly online enterprises.

As we develop expertise in new educational technologies, we imagine that Stanford may produce a significant number of high-quality courses, or course components, that can be delivered online. These could be licensed to other non-profit colleges and universities, potentially expanding the course offerings at many institutions. Such external use of Stanford courses could also increase the recognition of Stanford faculty without raising problems associated with admitting and authenticating students. If the licensing terms involved some form of revenue, this revenue could offset the cost of producing the courses and compensate faculty for their efforts.

In the face of these promising alternatives, it is natural to ask whether Stanford should continue to provide free online courses (MOOCs) in a form that can reach tens of thousands of participants per course. The committee believes that there are benefits to these courses, which Stanford has to date delivered on an experimental basis through Coursera, a for-profit company founded by two Stanford computer science professors. These free online courses have attracted substantial media attention. The faculty involved have found the massive online audience highly rewarding. Successful courses also enhance the reputation of the instructors and have the potential to attract large numbers of productive and deserving students to our residential undergraduate and graduate programs. In addition, MOOCs provide a currently popular framework for Stanford faculty to develop and evaluate new online teaching and learning methods. The lessons learned through producing and delivering MOOCs may therefore help us improve teaching and learning for on-campus students and for other kinds of distance learners.

Based on these and other considerations, the committee supports further investigation, involving faculty consultation and careful consideration of all relevant factors, of potential development in three directions:

1) **Stanford programs, with admissions criteria and certification**, possibly beginning with graduate or professional education programs developed by schools that choose to do so.

2) **Licensing and distribution of Stanford courses to other non-profit colleges and universities.**

3) **Continued experimentation with external delivery of courses** on a modest scale, possibly including experiments with alternative credentialing options and value-added models.

**Course Ownership and Faculty Policy**

New online organizations with new and as-yet-unknown business models pose various risks. For example, courses developed by Stanford faculty and delivered by independent unaffiliated online organizations could compete with Stanford’s own programs. New organizations could also solicit faculty participation in ways that could undermine our primary teaching obligation to meet the needs of enrolled Stanford students. The committee recommends that Stanford clarify the faculty’s primary
obligation to Stanford students and further act as appropriate to protect the university’s rights and interests against online organizations that might independently package Stanford content.

While the committee supports traditional faculty authorship rights and expects Stanford to share income associated with expanded online programs with faculty, the current Research Policy Handbook (secs. 5.2 and 4.1) and Faculty Handbook (sec. 2.7G) assert institutional ownership of courses and courseware and prohibit Stanford faculty and instructors from regular teaching for other institutions. One principle recommended by the committee is that Stanford should treat teaching for online institutions in the same way as teaching for traditional brick-and-mortar universities. For example, if existing policy would prevent a faculty member from teaching at a competing university such as UC Berkeley, then it is appropriate to similarly ask faculty not to teach for competing online universities.

Based on extended discussion, the committee supports Stanford ownership of courses and courseware for the purpose of protecting Stanford’s interests against competing organizations. At the same time, the committee generally accepts the common practice of sharing course materials with peer faculty at nonprofit academic institutions and ordinary scholarly exchange such as guest lectures and sabbatical teaching.

In formulating a set of recommended principles listed below, the committee found it difficult to formulate a bright-line distinction between courses, which could be considered institutional work for hire, and course materials, which may include viewgraphs, lecture notes, problem sets, and other material that could be put in a textbook (traditionally owned by faculty). Two distinguishing factors, however, are assessment, performed by an instructor or an automated instrument reflecting the instructor’s criteria, and certification, such as institutional certification or a “statement of accomplishment” by an instructor.

**Reaffirmation of traditional faculty authorship rights**- Consistent with longstanding academic tradition, Stanford does not claim general ownership to pedagogical, scholarly, or artistic works such as popular nonfiction, novels, textbooks, poems, musical compositions, unpatentable software, or other works of artistic imagination, regardless of their form of expression, provided the works are not subject to the exceptions set forth in Chapter 5 of the Research Policy Handbook.

**Distribution of course materials**- The committee recognizes the University policy that courses taught and courseware developed for teaching at the University belong to Stanford. This policy applies regardless of the form of expression but excludes traditional textbooks printed on paper or textbooks in equivalent electronic form such as pdf files. However, the committee recommends an express clarification to the policy to acknowledge that faculty may make course materials created by individual instructors available for noncommercial academic or personal use outside the University. Further, if a faculty member leaves the University, the committee recommends that he or she should be permitted to use such course material he or she created at Stanford at another nonprofit academic institution, under similar terms.

**Teaching and course development at other institutions**- Faculty owe their primary teaching duty to the University. Any teaching outside of the University must be consistent with the University’s policies on
conflict of interest and conflict of commitment and any additional school policies formulated by the
cognizant dean.

**University name usage**- The committee recognizes that use of the University’s name is itself a significant
University resource and implicates the interests of the university. Additionally, use of the University’s
name can affect the reputation and academic standing of the institution and the professoriate. Any use
of the University name (other than traditional use to identify the creator by his or her title at Stanford)
in connection with a work created by a faculty member must follow the guidance set forth in the
Administrative Guide.

**Commercialization**- Consistent with existing University policies regarding the commercialization of
inventions, any commercialization of course content and courseware created and taught at Stanford will
be undertaken by the University. However, the committee recommends that the University not
undertake any commercialization without the agreement of the faculty-creator. The University should
ensure that any revenue arising from commercialization will be shared among the creators, schools,
departments and the central University, consistent with the existing policy in the Research Policy
Handbook.

**Compensation for course development**- The committee recommends that, to the extent that a
department or school specifically commissions the development of course content or courseware, the
provision of supplementary compensation, if any, will be guided by the policies set forth in Section 5.1 of
the Faculty Handbook and relevant school policies.

**Content Production**
As we develop online teaching and learning material, the committee believes that Stanford should
manage content production and maintain ownership of courses rather than transfer ownership to any
external content delivery organization or content aggregator. This allows the University to brand
courses uniformly, regardless of changes in delivery platform that may occur in coming years. We also
imagine that the University may wish to archive courses that are delivered once on one platform, serve
them on another platform, or make excerpts available on yet others. As technology and teaching models
evolve, on-campus management of content production appears to be the best way to save faculty time,
leverage faculty innovation, encourage high quality, and maintain leadership in online learning.

In light of the value of managing content production and maintaining ownership of courses, the
committee recommends that the University make a sufficient financial commitment to cover the costs
of content production and the development of multiple distribution channels in the near term. This
could involve significant investment: MIT and Harvard have each committed $30 million to their shared
content production and delivery organization. Some of the costs associated with content production
accrue from copyright and accessibility issues, in addition to costs associated with design, editing, video
recording, and post-production.
Content Delivery

Over ten experimental courses have been delivered to date through a start-up company, Coursera. The initial interim agreement with Coursera allowed each course to be delivered publicly, without monetization, and without any payment from Stanford to Coursera or vice versa. Each course ran on a schedule controlled by the instructor, with assignments due at specific times. Running online courses on a semi-synchronous schedule produces a large cohort of participants who progress through the course at essentially the same pace, comparing notes through the online discussion forum. Participants who completed a course received an informal statement of completion signed by the instructor. This statement, a printable pdf file, explicitly states that no Stanford credit is involved. Because it was not possible to verify the identity of online course participants, a disclaimer to this effect was also included.

As of April 2012, faculty developing experimental courses were pleased with the process of working with Coursera. Course materials for some of the courses were made available in an asynchronous mode, after the course opened or completed, without a fixed pace and without a certificate of completion. Coursera also provided data associated with each course. Email addresses were made available to Stanford as part of the agreement, and we conducted an additional survey to understand the demographics of the participants and evaluate the success of the courses.

In the first half of this year, Stanford course content and limited use of the Stanford brand have helped Coursera establish itself in the marketplace. As the market develops, Coursera and other content aggregators are likely to develop plans for monetization. In managing the risk to Stanford, the committee believes we should be vigilant about branding and pay careful attention to the possible consequences of potential monetization schemes. Some faculty external to the committee and some members of the committee also advocate alternatives, such a Stanford-developed platform or an agreement with an external non-profit organization (e.g., Khan Academy).

Based on the success of courses released to date, the committee supports near-term allocation of University resources to support faculty, departmental, and school experiments with free online courses that do not carry Stanford or external certification. The committee recommends paying appropriate attention to risks to the reputation of Stanford and its faculty. In particular, the committee sees tradeoffs associated with distributing courses through an external provider. We believe Stanford should be especially careful to protect its interests when:

a. Students log in through a site that carries a brand other than Stanford.

b. Prominent branding is associated with the content aggregator (hosting site).

c. There is no way to authenticate the work performed by the participant.

d. Certification is provided by an aggregator, especially when it is based on completion of courses from more than one source (e.g., Stanford and other universities).

e. Monetization is directed by the content aggregator.
Summary Points
In concluding meetings of the committee, we focused on articulating our main points of consensus about Stanford’s mission, faculty interest, faculty policy, and the questions about content production and delivery posed in the Charge to the Committee. These points are summarized as follows:

1) The committee believes that Stanford’s primary educational mission is to educate students who apply to our programs and meet our admissions criteria.

2) Faculty have substantial enthusiasm for exploring new uses of educational technology. This enthusiasm has been expressed by developing online courses and in informal surveys by members of the committee. Faculty interests include improving the education of matriculated students on campus, building capacity for enrolled students off campus, and offering free large-scale distribution of some form of online courses.

3) The committee reaffirms traditional faculty authorship rights and supports Stanford ownership of courses and courseware in order to protect Stanford’s interests.

4) The committee found it difficult to formulate a bright-line distinction between courses, which could be considered institutional work for hire, and course materials, which may include viewgraphs, lecture notes, problem sets, and other material that could be put in a textbook and owned by faculty. Two distinguishing factors are assessment, performed by an instructor or an automated instrument reflecting the instructor’s criteria, and certification, such as institutional certification or a “statement of accomplishment” by an instructor.

5) Stanford should protect its rights and interests against online organizations that package Stanford content.

6) The committee supports further experimentation and evaluation of at least three models: (i) online and hybrid programs for admitted students, (ii) licensing courses to other non-profit colleges and universities, and (iii) continued near-term experimental external delivery of courses (MOOCs).

7) The committee sees tradeoffs associated with distributing courses through an external provider. Stanford should be especially careful to protect its interests when:
   a. Students log in through a site that carries a brand other than Stanford.
   b. Prominent branding is associated with the content aggregator (hosting site).
   c. There is no way to authenticate the work performed by the participant.
   d. Certification is provided by an aggregator, especially when it is based on completion of courses from more than one source (e.g., Stanford and other universities).
   e. Monetization is directed by the content aggregator.
8) The University should make a sufficient financial commitment to online education and on-campus use of innovative technology to cover the costs of content production and the development of multiple distribution channels for faculty in the near term.

9) The committee supports near-term allocation of University resources to support faculty, departmental, and school experiments with free online courses that do not carry Stanford or external certification.

10) The committee recommends that decisions regarding the specifics of faculty incentives and rewards should be determined by the departments, schools, or programs that develop official Stanford programs.

11) The committee believes that long-term changes in the use of educational technology can and should be beneficial to the University, although the long-term distribution models are not presently clear.

12) The committee believes that although online experiences will enhance Stanford’s educational mission, on-campus students and excellent traditional teaching efforts by the faculty must continue to receive our primary attention and recognition.

**Concluding Remarks**
Although distance learning and web delivery are well established, the world of online learning is changing rapidly. In part, the revolution is marked by the fact that Stanford and other leading universities have provided free educational opportunities on a large scale. Khan Academy has also demonstrated the power of asynchronous web delivery and fostered a number of visible pilots in K-12 school programs. We anticipate that the next three to five years will be rocky and unpredictable, with some dramatic changes occurring rapidly and unsettlingly.

The Committee believes that Stanford should remain a leader in educational innovation. To that end, we recommend that the University allocate sufficient financial resources to allow Stanford faculty, departments, and schools to experiment broadly, developing expertise in evolving educational technology and uncovering new ways to improve education for our traditional student audience and the broader community around us.