

FACULTY COMMITTEE
ON THE FUTURE OF
TECHNOLOGY-ENHANCED
EDUCATION AT NYU

FINAL REPORT
JUNE 2014



NYU

FACULTY COMMITTEE ON THE FUTURE OF TECHNOLOGY-ENHANCED EDUCATION AT NYU

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I. INTRODUCTION

Over the last few years, both the academy and the popular press have increasingly focused on the uses of technology in higher education. There are several reasons for this increased interest.

“...digital literacy has become increasingly important not only to students’ intellectual development but also to their employment prospects after graduation.”

First, students entering undergraduate and graduate programs have come of age in an information environment increasingly dominated by digital technologies. As a result, questions have arisen about whether students today might be learning differently. This concern has reignited the general question of how universities might support faculty in using instructional technologies to improve students’ learning outcomes. Should faculty, for example, “flip” classes to provide lectures online and use classroom time instead for discussion and interaction? How can students be actively engaged in meaning-making and problem solving? And how might students be supported by learning tools that allow for personalized learning approaches at their own pace and in their preferred mode?

Second, whatever their field of study, digital literacy has become increasingly important not only to students’ intellectual development but also to their employment prospects after graduation. Although most students who enter higher education today have been immersed in digital media (especially social media), they often lack the kinds of sophisticated digital skills that they will eventually need to thrive in their professional lives. How might faculty integrate the acquisition of these skills into the learning outcomes of courses and curricula across the range of disciplines?

Third, technology may create opportunities for universities to address more effectively larger issues with which they have been grappling. In addition to improving teaching and learning, these issues include increasing the access that students have to higher education by reducing costs, protecting and enhancing revenue to support the teaching and research missions of the institution, mitigating risks, and reaching new constituencies. Over the past two years, the lion’s share of articles on technology-enhanced education has been devoted to massive open online courses (or MOOCs), to the extent that some commentators have referred to 2012 in particular as the “Year of the MOOC.” Unfortunately, this discussion of MOOCs in the media has eclipsed that of other forms of technology-enhanced education.¹ In addition, it has taken attention away from a number of important questions—e.g., which tools should be used for which learners, for which subject areas, and under which conditions?

¹ For a recent study on MOOCs, see *Fiona M. Hollands and Devayani Tirthali, “MOOCs: Expectations and Reality” (Columbia Teachers College, May 2014)*. This article has been posted to the *bibliography of articles on technology and education* on the Committee’s website.

Finally, many universities have been motivated to explore technology-enhanced education for institution-specific reasons. At NYU, in particular, there have been extensive discussions recently about the diverse curricular and cocurricular opportunities available to our students, such as study within the global network, internships, and experiential learning (including clinical training). What is the role for technology in facilitating students' engagement with these opportunities and in making connections possible across disciplines, schools, and sites? Over the past two years, for example, departments and schools have established academic pathways across NYU's global network, identifying the sites and portal campuses where they will build curricula for their students. How might the use of technology enable our students to take full advantage of opportunities for study and collaboration within the network? Moreover, to what extent is NYU's unique value proposition dependent precisely on the interface between global education and technology?

This is an exciting moment in the history of education, and universities will have extraordinary opportunities in the coming years to enhance, remake, and transform what they do. Not every university (or every unit within a given university) will share all of the concerns noted above. But universities must nonetheless understand these issues and explore the possibilities of technology-enhanced education, study the implementation methods of other research universities and the best practices that have emerged from that experience, and develop appropriate strategies consistent with their own distinctive missions.

To that end, in December 2012, President Sexton and Provost McLaughlin formed the Faculty Committee on the Future of Technology-Enhanced Education at NYU to "set forth principles and parameters that can guide the University in using technology to support its academic mission and further its commitment to innovation in teaching and learning, pedagogical practices, and research." (See the Committee Charge, Appendix A.)

Cochaired by Richard Matasar (Vice President for Enterprise Initiatives) and Matthew S. Santirocco (Senior Vice Provost for Undergraduate Academic Affairs), the Committee began meeting in January 2013 and met 26 times over the course of the spring 2013, fall 2013, and spring 2014 semesters. (Meeting agendas and minutes can be found on the Committee's [website](#).) In July 2013 the Committee submitted an Interim Report to the President and the Provost, which was subsequently shared with the NYU faculty and was posted on its [website](#). (For a summary of the Interim Report, see section III.1.)

II. PRINCIPLES

In responding to its charge, the Committee considered the relevance to NYU of the questions noted previously, taking into account both the University's organizational structure and concurrent community-wide discussions. In its deliberations, the Committee was guided by the following principles:

- **Subsidiarity.** Technology-enhanced educational innovation is driven by faculty and takes place within the framework of faculty governance at the local level, including (but not limited to) curriculum review mechanisms within individual departments and schools. Generally, this principle of subsidiarity requires deference to local decision making.
- **Experimentation.** The University should encourage faculty in the schools to experiment with methods and tools of technology-enhanced education. This locally based experimentation can take place at multiple levels, both within individual courses (credit-bearing and noncredit undergraduate and graduate) and across programs. The primary goal of such experiments should be to improve students' learning outcomes. They may also provide opportunities to address other goals noted in the introduction to this Report.²
- **Evaluation.** We should evaluate the impact of these diverse experiments on student learning, motivation, and related outcomes. This is in keeping not only with the University's educational mission but also with its status as a premier research institution.
- **Communication.** The findings and best practices that emerge from such experiments should be communicated and widely discussed throughout the NYU community so that we can learn from one another. They should also inform any possible University-level initiatives and strategies that may emerge over time in the domain of technology-enhanced education.

² One of these goals might be to protect against possible competition by online education providers. While the Committee discussed this topic at length, it takes no view on the likelihood of such "disruptive" business models' affecting NYU. Some Committee members think that such threats are imminent; others are doubtful of their impact on NYU. All members of the Committee agreed, however, that NYU must aggressively experiment with various digital modalities and programs so that we are prepared to face any challenges posed by technology-enhanced education and, even more important, to take advantage of the opportunities for innovation in teaching and research afforded by new technologies.

III. COMMITTEE PROGRESS

1. Summary of the Committee's Interim Report

The Committee's *Interim Report* (July 2013) provided an overview of the actions that the Committee had taken since its inception, chief among which was the creation of a website containing resources for the University community. (See the Interim Report, Appendix B.) Those online materials included an inventory of the more than 600 current online and hybrid/blended courses at NYU as well as a selection of recent articles on technology and education. In addition to creating and publicizing this website, the Committee announced plans to conduct in-person consultations with faculty in the schools (see III.2.c), beginning in fall 2013. The Interim Report also noted that a subcommittee had been appointed to identify best practices in technology-enhanced education, as a part of the Committee's overall consultation strategy. Finally, the Interim Report included a number of observations and recommendations. It stressed, for example, that technological enhancements to courses at NYU must be of the highest possible quality and that faculty need to be supported at whatever point they are teaching along the continuum of use, from seminars and lectures that use some digital content to fully online courses. While some of these recommendations have been refined for this Final Report, a number of them have already resulted in concrete actions.

“...technological enhancements to courses at NYU must be of the highest possible quality...and faculty need to be supported... along the continuum of use, from seminars and lectures that use some digital content to fully online courses.”

2. Committee Actions since July 2013

Since the Interim Report was issued, the following actions have been taken:

(a) Faculty Support. On the recommendation of this Committee, in spring 2013 the Division of Libraries, Global Technology Services, Information Technology Services (ITS), the Office of Academic Assessment, and the Center for the Advancement of Teaching convened a team of experts to develop an Enhanced Service Model for Instructional Technology Support (ESMITS). The goals of this exercise were to help instructors locate support services more easily and efficiently and to develop new services to address unmet needs; to capture metrics to identify emerging trends; to facilitate ongoing improvements; and to leverage collective strengths and skills across the participating units. In August 2013 the ESMITS team established an enhanced support system that enables faculty to access services in three ways: online, via a new website (nyu.edu/instructional-technology-support) that provides answers to common questions (through FAQs, video tutorials, and the searchable database NYU ServiceLink); over the telephone, via the ITS Service Desk (212-998-3333); and in person, at the Digital Studio on the 5th floor of Bobst Library, the IT Service Desk on the 4th floor of 10 Astor Place, and at Global Technology Services at 3 Washington Square Village. (Users can also schedule appointments at the Digital Studio through the Instructional Technology Support website or by dialing 212-992-9233.) The new service model was piloted at Steinhardt in September; after refining the

model the service was extended to the entire NYU community in November. (For a report on the first year of ESMITS, see Appendix F.)

(b) Frequently Asked Questions. In preparation for its fall consultations with faculty in the schools, the Committee developed a set of FAQs on such topics as ePortfolios, “flipped” and hybrid/blended classes, fully online courses, open education, classroom technology (including videoconferencing equipment), and compensation and course release. These FAQs are posted on the Committee’s [website](#).

(c) Consultations. In fall 2013 the Committee conducted wide-ranging consultations with groups of faculty throughout the University as well as with students and some Trustees. Committee members fanned out in small groups to meet colleagues in a variety of venues, including departmental and school-wide meetings as well as meetings of standing University committees. (A complete list of these more than 50 consultations can be found in Appendix C.)³ These consultations offered an opportunity to update the NYU community on the Committee’s progress and to hear colleagues’ questions and concerns.⁴ In addition, each consultation provided an opportunity to stimulate an ongoing discussion about technology-enhanced education. The results of these consultations inform the recommendations in this Final Report. Among the topics discussed were the following:

- particular technologies, such as NYU Classes and Google Apps for Education;
- the technology-related resources available to support faculty at the University and school levels (e.g., training opportunities, funding, and facilities);
- courses that are already using technology in innovative ways;
- digital scholarship;
- the impact of technology on class size and faculty workload;
- the use of technology in low-residency graduate programs;
- the role of technology in NYU’s global network;
- the usefulness of grants in encouraging technology-based innovation;

³ The Committee did not engage in formal consultations with faculty at NYU Abu Dhabi, NYU Shanghai, or the 11 global sites. But colleagues in Global Technology Services who participated in our meetings travel regularly to the portal campuses and global sites, and our recommendations have been informed by the ideas and concerns of the faculty there with whom they interact.

⁴ As a result of the Committee consultations and the increased visibility of University-level support in this area, instructional technologists in Global Technology Services and Information Technology Services also conducted dozens of additional consultations with faculty, departments, and programs interested in learning more about enhancing their teaching and their curricula using technology.

- University policies related to governance, copyright, and intellectual property;
- strategic planning and communication around technology at NYU;
- the pros and cons of establishing institutional partnerships with MOOC consortia;
- the lessons that NYU can draw from the experience of peer and target institutions; and
- the possibility of using technology-enhanced education to provide greater access to NYU by making education more affordable, to promote circulation in NYU's global network, and to meet financial goals (e.g., to mitigate risk and to find new sources of revenue).

(d) Sampler Website. During the consultation process, many faculty sought specific guidance about how exactly they might incorporate technology into their teaching. In response to such requests, Global Technology Services (GTS) developed a website, *NYU Technology-Enhanced Education Sampler*, which provides concrete “exhibits” illustrating the diverse ways in which instructional technologists in GTS have collaborated with schools, departments, and individual faculty members to design or redesign courses and course materials. Examples include uses of video, animation, social learning platforms, and information visualizations.

(e) Best Practices. In December 2013 the Subcommittee on Best Practices for Teaching and Learning in the 21st Century (chair: Tom Augst, FAS, English) developed two documents intended to serve as resources for the NYU community:

“Best Practices for Institutional Support of Technology-Enhanced Education,” which offers guidance to schools on how to foster cultures of experimentation through professional development and support as well as through curricular development and assessment

“Best Practices for Course Design and Instruction,” which identifies several strategies that faculty can adopt, not only in traditional in-person and hybrid/blended courses but also in fully online courses

Both documents are posted onto the Committee's [website](#).

(f) Educational Outreach. Following on the recommendation of our Interim Report, the Committee is developing a conference on technology-enhanced education, which will take place at NYU on September 12, 2014. The working title of this conference is “Beyond the Year of the MOOC: Beginning a Conversation about Technology-Enhanced Education at NYU.” Panels will focus on the impact of instructional technology on learning outcomes, the cognitive science of technology-enhanced education, disruptive technologies and the economics of higher education, and the potential uses of technology in global education. In addition, NYU faculty will present on and share creative uses of technology in their teaching. (For further discussion about educational outreach to the NYU community, see section IV.3.)

BEYOND THE YEAR OF THE MOOC

When the *New York Times* declared 2012 to be the “*Year of the MOOC*,” enthusiasm was running high, with schools, students, and investors lining up to participate. But, as sometimes happens when enthusiasm spikes, there is a sobering morning after. *One analyst concluded* that as the first assessments were completed, “the open-online model appears to have earned an incomplete, at best.” Completion rates are low, comparisons

with traditional course offerings are mixed, and no sustainable business model appears to have emerged. Some argue that the term MOOC has become a signifier for a series of interrelated developments in student expectations, learning technologies, curricular evolution, and the shifting economics of higher education. Our conference on September 12 will be devoted to exploring these developments, drawing on expertise here at NYU and beyond. (For a tentative program for the conference, see Appendix G.)

IV. OBSERVATIONS AND RECOMMENDATIONS

While the Committee was pursuing the active agenda noted previously, members also familiarized themselves with the literature and issues surrounding technology-enhanced education, and then discussed in depth four large topics: (1) experimentation, research, and evaluation; (2) governance and policies; (3) supporting and educating the community; and (4) technological infrastructure.

1. EXPERIMENTATION, RESEARCH, AND EVALUATION

(a) A Culture of Experimentation.

New digital tools provide additional ways to educate students. Rather than replacing one way with another, they represent a chance to create substantially new ways to approach content, student learning, research practices, and assessment. Traditional teaching that has worked will continue to work, but new tools add new possibilities. The task is to identify which of those tools will help us educate students more effectively, for which subject areas, and under which conditions. For this reason, NYU must encourage experimentation with, research into, and evaluation of methods and tools of technology-enhanced education. This is responsive both to learners' expectations and to the best traditions of research universities, which constantly seek improvement in learning outcomes.

Faculty should drive experimentation. They know the intersection between their research and teaching interests and classroom instruction, and they are in the best position to imagine and assess the effects of new approaches to teaching and learning. This is all the more important since the variation and scope of teaching activities at

NYU will often make uniformity impossible and even undesirable. The subjects taught at NYU range from pre-Homeric myth to gene splicing. The students range from newly admitted freshmen in Shanghai to PhD candidates finishing

MEDICAL EDUCATION IN THE 21ST CENTURY

The Institute for Innovations in Medical Education was recently established (a) to develop a system of personalized medical education to help students master core competencies, such as in the new three-year MD pathway; (b) to use educational “big data” to drive new teaching, learning, and assessment models; and (c) to integrate the educational and clinical missions of the school to create a system of continuous learning, embedding data analytics that promote positive action by students, faculty, and their collaborators. To achieve these goals, the institute has developed an Education Data Warehouse that contains a comprehensive picture of all learners, as well as detailed information on curricula and assessments; the BioDigital Human, a 3-D virtual reality human anatomy simulator; the NYU Virtual Microscope, a collaborative microscopy system that has replaced the use of physical microscopes across the school; new iPad apps to assess student performance in the hospital setting; and a comprehensive ePortfolio system.

course work at Washington Square. And the available technologies range from basic presentation technology installed in University classrooms to courses taught fully online in NYU Classes.⁵

Depending on needs, experiments in technology-enhanced education may occur at different levels. Many (perhaps most) will be driven by individual faculty. Others will be undertaken by faculty working collectively in their departments and schools. A department or school might, for example, choose to experiment with digitizing lectures or other course materials and making them available to students online so that they have more flexibility to study within the global network.⁶ Another unit might choose to revamp a sequence of courses by using technology to promote adaptive learning.

This sort of faculty-driven experimentation by individuals or their departments and schools is consistent with the principle of subsidiarity discussed elsewhere in this report.⁷ It is also an implicit bet against some of the “Big Bang,” university-wide efforts in which some of our peer institutions have engaged. The Committee does not believe that a highly prescriptive master plan or single contract with an online partner could successfully represent the whole University. With this in mind, the Committee continues to recommend (as in our Interim Report) against making high-level university-wide decisions about partnerships with MOOC consortia or full-service online providers, at least at the present time.⁸

GAMES FOR LEARNING

The Games for Learning Institute (G4LI) is a multi-institutional research initiative. Researchers study existing games, identify key design elements and learning patterns, develop prototype “mini games” based on these elements and patterns, test them in classroom and informal learning settings, and assess a broad range of outcomes. The initial focus of this research is on STEM education at the critical learning point of the middle school years (grades 6-8). The work of the institute continues at MAGNET, the newly established Media and Games Network at 2 MetroTech Center in Brooklyn, which is a collaboration among Courant, Polytechnic, Steinhardt, and Tisch.

5 As noted, in its Interim Report (Appendix B), the Committee observed that “there is a broad continuum of technology-enhanced education, stretching from in-person lecture courses and seminars with digital enhancements to ‘flipped classes’ that deliver lectures or other ‘content’ online and reserve in-class time for discussion to fully online courses” (p. 2). (See the Interim Report, Appendix B.)

6 For further discussion of technology-enhanced teaching across NYU’s global network, see section IV.4.c.

7 See section IV.2.a.

8 This does not, however, preclude a school from pursuing such relationships (in consultation with the Provost), should its faculty choose to do so, in which case the Committee would encourage a broad dissemination of outcomes with the University.

“By developing a culture of pedagogical experimentation, NYU might define itself as a ‘laboratory for learning,’ fostering multifaceted approaches to digital learning...”

Instead, to foster local experimentation in technology-enhanced education, we encourage the University to establish a competitive grant process to develop innovative projects on the model of the Curricular Development Challenge Fund.⁹

(b) A Culture of Assessment. As the Committee’s extensive inventory of online and hybrid/blended courses currently offered at NYU has revealed, many experiments in technology-enhanced education are already taking place here. But, like many of our peer institutions, we do not always assess each innovation with rigor, nor do we have adequate mechanisms for making faculty aware of the range of experimental options. This must change. We need a better framework for learning from our experiments with new digital teaching and learning techniques. If our experiments are to be informative, we need to adopt best practices for the assessment of how a new technique will improve learning processes and outcomes. As a university community, we should combine our commitment to improving learning outcomes with our interest in conducting research. At the very least, it should be the practice that any course significantly enhanced by technology be assessed in terms of its impact on student learning, motivation, and related outcomes.

(c) A Research Agenda. Members of the Committee have reviewed the research literature on the relative pedagogical effectiveness of various technology-enhanced approaches to instruction. It is a complex literature with no clear-cut summative conclusion, though a meta-analysis published in 2010 by the US Department of Education found that hybrid/blended modes of instruction offer some educational advantages over fully in-person or fully digital formats.¹⁰ The fact remains that existing scholarship is not yet able to answer many other questions regarding what types of faculty, students, and curricular content work well in a digital environment.

NYU has the potential to be a leader in research on technology-enhanced education. By developing a culture of pedagogical experimentation, NYU might define itself as a “laboratory for learning,” fostering multifaceted approaches to digital learning that could be used not only in programs across our global network but also by other institutions (in the spirit of Carnegie Mellon’s Open Learning Initiative).

To that end, some faculty and administrators have already been exploring the possibility of creating a Digital Education Research Center (DERC) at NYU. Such an undertaking would rely upon several areas of expertise that already exist here and would provide faculty working in these areas with incentives

⁹ The *Curricular Development Challenge Fund* is administered by the Office of Faculty Resources.

¹⁰ “*Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.*” US Department of Education, Office of Planning, Evaluation, and Policy Development, Policy and Program Studies Service (September 2010). This article is included in the Committee’s online *bibliography* of articles on technology and education.

to collaborate across disciplines. Indeed, NYU Steinhardt faculty in several programs have been thinking about the design of effective environments for teaching and learning for decades.¹¹ They focus particularly on the theoretical foundations of effective teaching and learning, the design of learning activities, ways of meaningfully assessing learning, ways of individualizing learning experiences, and ways of fostering peer-to-peer and teacher-student interactions.

Establishing such a research center would enable the University to tap into the expertise and creative potential of NYU's faculty. If done thoughtfully and with adequate resources, such innovations would provide significant data on the learning process and learning outcomes. NYU data science faculty could develop methods to visualize and analyze these data and could help the University community understand them in the context of other available data sets. The DERC's mission would be to publicize the results of such experiments, help faculty to use the most effective tools for their experiments, and bring to NYU researchers from other universities who could share their work with our community.¹²

This is an endeavor worthy of a research institution such as NYU, since it combines in an exciting way the University's research and teaching missions into one "grand challenge" of cross-disciplinary work. The Committee

PUBLIC HEALTH CORE COURSE CERTIFICATE

In fall 2014 the Global Institute of Public Health will launch an online certificate, which will be composed of five core courses that are required for the MPH. Working with Global Technology Services, institute faculty are developing interactive modalities for these courses that are compatible with asynchronous learning and that support students' mastery of learning objectives. Individuals who complete the certificate will be eligible to take the national exam for the Certified Public Health (CPH) credential. Those who already meet the requirements for the CPH exam will have the option of a self-paced online review course. The certificate is intended to be particularly attractive to federal, state, and local health departments and public health agencies as well as to physicians, dentists, nurses, physician assistants, and students who are interested in enhancing their professional portfolio or pursuing an MPH.

¹¹ For example: Steinhardt faculty express these research interests programmatically in the Department of Administration, Leadership, and Technology (which offers two relevant master's programs in Digital Media Design for Learning and in Games for Learning as well as a doctorate in Educational Communication and Technology), the Department of Teaching and Learning, the Consortium for Research and Evaluation of Advanced Technologies in Education (CREATE), and the Center for Research on Higher Education Outcomes (CRHEO).

¹² An example of such an experiment might be to ask willing schools to identify courses (for a sequence of six to 10 courses), each of which could be taught in two ways (one in a traditional, fully in-person format and the other in a hybrid/blended or fully online format) to equivalent groups of students. Both formative and summative assessments of the paired courses would be conducted and compared, with the results disseminated widely to the University community.

recommends, therefore, that the University establish the Digital Education Research Center, with initial funding over a three- to five-year period. During this start-up phase, the center would seek outside funds to support its work, with the goal of establishing permanent and sustainable funding.

(d) Open Education. The Committee believes that another University-level initiative, Open Education (OE), provides an additional opportunity to experiment with technology-enabled educational tools. OE describes the concept of sharing educational resources freely with those interested in learning and who have access to an Internet connection. Institutions engage in OE for many different reasons, from outreach to the community to branding and marketing. In 2010, NYU was among the first institutions to launch an *Open Education pilot*. Like most OE initiatives, NYU's program is tuition-free and does not award any certificates, badges, diplomas, credits, or grades to students who complete an OE course. At present, however, this program resembles what most of our peer institutions were doing four years ago—i.e., using course-capture technology to produce video recordings of faculty as they teach their in-person courses on campus.

The program is not, therefore, specific to NYU, nor does it make full use of recent technological possibilities. The University should experiment with different approaches to OE. Moreover, as a community with many learned members—students, alumni, faculty, and staff—NYU's efforts in the OE sphere should seek ways to empower peer-to-peer teaching and learning as well as more traditional, instructor-driven methods of OE. Such efforts may model methods for university communities to engage every stakeholder in continuing education, broaden the knowledge base, and decentralize teaching and learning. This is a distinctively social approach to OE that could provide yet another method for experimentation at NYU.

THE EDUCATION OF CHILDREN WITH DISABILITIES

Excluding children with disabilities from education and employment has high social and economic costs. Yet reports by UNESCO and UNDP reveal that 90 percent of children with disabilities in developing countries do not attend school and that the global literacy rate for adults with disabilities is as low as 3 percent (1 percent for women with disabilities). Capitalizing on NYU's global locations and IT infrastructure and in partnership with the Children's Museum of Manhattan, the Guangdong Disabled Persons' Federation, and the Israel Foundation for Handicapped Children, this project is developing a global digital platform, a virtual lab that will support the following goals: (a) organizing a global network of parents, advocates, and policy professionals serving students with disabilities worldwide; (b) strategizing to establish, document, and disseminate information regarding the education of students with disabilities; and (c) establishing a process to collaborate with agencies in the global community.

RECOMMENDATIONS ON SECTION IV.1

Recommendation 1: Encourage individual faculty members, departments, and schools to experiment with technology-enhanced approaches to teaching, learning, and research.

Recommendation 2: Conduct research on and evaluate which technologies enhance student learning outcomes, for which subject areas, and under which conditions.

In support of the above:

- Establish a competitive grant, along the lines of the existing Curriculum Development Challenge Fund, to support faculty who want to explore creative uses of technology in their courses; develop a set of criteria for evaluating submissions.
- Refrain from making high-level university-wide decisions at the present time about partnerships with MOOC consortia and full-service online providers, but continue to allow individual schools to pursue such relationships in consultation with the Provost. (Commitments with MOOC consortia should occur at the course level, and then only through the appropriate faculty governance mechanisms.)
- Develop NYU-specific versions of Open Education that make use of social media and video lectures; encourage development of peer-to-peer Open Education projects.
- Establish a Digital Education Research Center, with start-up funding over a three- to five-year period, to facilitate faculty research into technology-enhanced education, to disseminate research conducted here and elsewhere, and to serve as a resource for interested faculty.
- Ensure that any technology-enhanced course supported by the University is assessed in terms of its impact on student learning, motivation, and related outcomes.
- Review individual schools' initiatives in technology-enhanced education to determine if a University-level strategy emerges, and prepare the University to respond to both challenges and opportunities that arise in this area.

“...programs, departments, and schools should support the ethos of faculty-driven innovation and experimentation...such experimentation should take place in accordance with existing procedures for faculty governance over curriculum.”

2. GOVERNANCE AND POLICIES

(a) Governance. Technology-enhanced education at NYU is already subject to established governance rules, most commonly when a course instructor (or program director) makes a decision about how and when to use technology to deliver content and to interact with students—e.g.: whether and how to use NYU Classes and/or Google Apps for Education, whether and how to use PowerPoint presentations, whether to accept (or, in some cases, to require) assignments as electronic submissions, or even whether and how to allow students to use electronic devices in the classroom.

In the Committee’s view, the primary innovator and thought leader with respect to course design and course delivery is and should be the responsible faculty member. Faculty should be permitted and encouraged to experiment with instructional technologies in their teaching. That said, most teaching takes place within a program, department, or school, where the overall design and sequencing of the curriculum is the result of collective decision making and subject to faculty governance in the form of departmental and school-wide curricular committees and faculty ratification. When individual faculty members design and deliver course material, they do so within the context of the traditions and customs of an academic discipline, outside accreditation or credentialing requirements, and even the collective will of the program in which they teach. With regard to technology-enhanced education, the Committee’s view is that programs, departments and schools should support the ethos of faculty-driven innovation and experimentation and that such experimentation should take place in accordance with existing procedures and structures for faculty governance over curriculum. Ideally, schools and departments would not adopt rules that either limit or require faculty use of particular instructional technologies.

From this premise, the following governance issues require careful consideration. First, what is the appropriate relationship among the various institutional actors (e.g., faculty, department chair or program director, dean, provost), each with a measure of authority and influence over course design and course delivery? And second, what are the best mechanisms for establishing university-wide goals and directions, while still respecting individual schools’ different profiles and objectives?

Faculty have the primary responsibility for the development of new courses as well as new programs of study and degree requirements. In most schools, new courses are first proposed by individual faculty at the department or program level and reviewed at the school level by a faculty committee according to school-wide norms. Nothing about technology-enhanced courses—even those that might be conducted fully online—would require a change in this procedure.

While the principle of subsidiarity should be the norm for decision making regarding course design, course delivery, and curriculum in general, certain decisions regarding technology-enhanced education should be made at the school or University level. These include deciding when to commit significant University resources for the adoption and delivery of IT platforms and services, establishing rules and responsibilities governing the possible commercialization of course material, and establishing school or university-wide norms with respect to workload and evaluation of faculty (especially with respect to tenure and promotion) that pertain to technology-enhanced education.

(b) Successor Committee and Further Consultations. To advise the University on these and other issues regarding the goals of technology-enhanced education and the strategies for reaching these goals, the Committee recommends that the University establish a standing committee. While consisting primarily of faculty, this new committee should also include students; it should have technology experts from ITS/GTS and the schools serving on an ex officio basis; and it should consult broadly with all stakeholders in the University community.

One potentially useful strategy for such consultation has already been piloted by the Committee: crowdsourcing. The Governance Lab (GovLab) at NYU, a research center housed at NYU Wagner, is developing ways of using crowdsourcing to bring the voices of community members into the University's governance process. Over the past year, as part of its Open Peer Engagement Network (OPEN NYU) project, the GovLab has worked with NYU students and key University personnel to design, deploy, and test different technological platforms for engaging the community to promote more effective university governance. Members of our Committee have agreed to work with the GovLab to pilot a set of crowdsourcing experiments this summer to engage faculty, staff, and students around some of the key questions that are raised in this Report. The information that is gathered through these pilots will be presented to the NYU community at our conference in the fall.

(c) Policies. Promoting the type of experimentation recommended in this Report implicates many departmental, school, and University policies.

(i) Schools' Academic Policies. With regard to academic policies governing student course work, the Committee has discussed at length the restrictions on technology-enhanced courses that exist in some NYU schools as well as the possible impacts on student circulation across the University if students in one school are restricted from taking online courses offered by another school. Over time, the Committee is confident that this situation can be resolved, particularly once appropriate venues for cross-school exchange and collaboration are in place (see below, section IV.3); differences between units should not be an impediment to experimentation. In the meantime, the Committee urges schools to use existing mechanisms of faculty governance to consider whether and how, in the service of experimentation and student circulation, thoughtful adjustments might be made to existing academic policies governing student course work.

(ii) The University's Intellectual Property Policy. Over the past several months, as the Committee has consulted widely with faculty throughout the University, it has become apparent that there is some confusion about policies governing intellectual property rights in technology-enhanced materials and courses (referred to in NYU's *Intellectual Property Policy* as "Online Works"). Such confusion is common within universities, as such policies are not well publicized and are quite technical, and because of the great variation in how different online works are produced and used, the application of policies to specific situations requires discussion among all the relevant parties. Moreover, the norms for treating online works are evolving, both at NYU and throughout the academy. Further, even when the specific intellectual property treatment of an online work is clear, other rules, like the *Academic Conflict of Interest and Conflict of Commitment Policy*, may govern how the work is used.

Although these policies are quite complex, the following practices have emerged: When online works are created by a faculty member without substantial NYU resources (e.g., staff, equipment, design expertise, financial support), the works are controlled and owned by the faculty member. But when the creation of online works depends on substantial NYU resources, the University and the faculty member generally develop a specific agreement for the treatment of any newly created online work. Although each of these agreements will reflect the unique circumstances involved in the creation of the online work, they ordinarily have the following characteristics: (1) they respect the faculty member's ownership of any preexisting materials; (2) they identify clearly any portions of the course that are "commissioned works," or otherwise

“...when online works are created with substantial NYU resources, the University must ensure that faculty members understand their rights to the resulting work.”

owned by NYU; (3) they identify clearly how the materials can be used (within NYU and elsewhere, by whom, and under what circumstances); and (4) they define clearly how any emerging royalties will be shared.

The Committee believes that the relevant intellectual property rules governing online works and related conflict policy (*Academic Conflict of Interest and Conflict of Commitment*) are not well understood. Accordingly, we recommend that the University more widely circulate the relevant policies. Further, because the field of technology-enhanced education is rapidly changing, we believe that the University should review these policies continuously to ensure that they reflect the emerging best practices for such education. Finally, when online works are created with substantial NYU resources, the University must ensure that faculty members understand their rights to the resulting work.

(iii) Data Stewardship. Finally, in addition to promulgating policy on intellectual property, the University is engaged in a broad-based effort to refine NYU’s approach to data stewardship. This entails the commitment to protect, deliver, and ensure the value of a wide range of data and information assets, including but not limited to those associated with teaching and learning.¹³ Timely sharing, retrieval, and protection of all NYU’s electronic data is essential for productivity, knowledge creation and transfer, regulatory compliance, and risk mitigation. Yet decision-making responsibilities for data stewardship of all these elements are not well defined or communicated. As an integral part of the University’s governance structure for information technology, the University’s standing Teaching Technology Committee has held initial discussions on data stewardship. It is recommending a focus in the coming year on refining NYU’s approach to data stewardship of student work. The Committee endorses this approach and encourages university-wide attention to it in the year ahead.

¹³ Ever-increasing volumes of electronic data are stored at or by NYU—not only administrative records, but also instructional materials and student-produced work as well as community-generated contents, such as ePortfolio materials. The University anticipates that the volume of such data will only increase, as faculty “flip” more classes, offer more instruction online, integrate research and teaching opportunities, and consolidate learning outcomes across NYU’s global network. Meanwhile, the number of requests for access to such data is increasing for numerous important purposes, including analytics. Refining NYU’s approach to data stewardship means settling some key questions and communicating the answers to them—e.g.: Who are the designated stakeholders with ongoing stewardship roles for granting or denying access? What are the salient issues and the policies and plans to address them? And how are the relevant policies and plans coordinated, communicated, and enforced?

RECOMMENDATIONS ON SECTION IV.2

Recommendation 3: Ensure broad-based input into decision making about technology-enhanced education.

In support of this:

- Create a new standing committee to advise the University's decision making in this area. The committee should include one faculty member from each NYU school as well as representation from the Tenured and Tenure-Track Faculty Senators Council, the Full-Time Non-Tenure-Track/Contract Faculty Senators Council, and the Student Senators Council. In addition, instructional technology experts from ITS/GTS and the schools should be invited to join the meetings on an ex officio basis.
- Consult broadly with faculty, students, and staff on all matters regarding technology and education, using a variety of strategies, such as crowdsourcing, town halls, etc.

Recommendation 4: Encourage schools, working through their faculty governance mechanisms, to review any restrictions they may have concerning students' ability to use technology-enhanced courses to fulfill program and degree requirements.

Recommendation 5: Circulate widely the relevant intellectual property and conflict policies (*Conflict of Interest and Conflict of Commitment*), review them continuously to ensure that they reflect the emerging best practices for online works, and ensure that faculty members understand their rights with regard to the resulting work.

Recommendation 6: Resolve key questions about data stewardship to ensure that there is clarity about policies governing the use and management of the data generated by instructional technologies.

“...faculty also need localized support for ‘higher-order’ conversations.... To that end, the schools should hire adequate numbers of instructional technologists, preferably with a background in a relevant academic discipline.”

3. SUPPORTING AND EDUCATING THE COMMUNITY

The University administration has made it easier for faculty to discover services hosted by ITS, GTS, and the Libraries and to learn how to integrate those services into their teaching practices (see III.2.a). Although there is still room for improvement, communication has improved greatly, and the trajectory of service awareness remains positive. Through continuous assessment of the Enhanced Service Model for Instructional Technology Support (ESMITS), the Committee believes that faculty support will improve in the years ahead.

Despite the increased coordination of University-level support in this area as well as the 16 new positions for technology experts that have been created in GTS over the past year, the uneven levels of support within the schools makes it difficult to engage faculty in every unit to imagine new methods of teaching and research using technology. ESMITS can facilitate discipline-specific conversations about using instructional technologies, but its reach is limited; faculty in the schools need to have such expertise closer at hand.

Many faculty, for example, routinely look within their own departments and schools for assistance with instructional tools, such as NYU Classes and classroom technology. With this in mind, it will be helpful for departmental and school administrators to become familiar with the interfaces that ESMITS has developed to facilitate access to instructional technology services so that they can point faculty in the right direction. But faculty also need localized support for “higher-order” conversations, e.g., on pedagogical uses of various technologies and their effective integration into courses and curricula. To that end, the schools should hire adequate numbers of instructional technologists, preferably with a background in a relevant academic discipline.

These individuals should not, however, work in isolation; rather, they should meet regularly with representatives of the relevant University units to share ideas and to coordinate decision making. One goal of these meetings would be to ensure that, wherever possible, university-wide solutions can be reached that meet the larger technology needs of all the schools. This group should also be charged with reconfiguring the Committee’s website into an online resource for faculty, for which it should provide oversight. This will necessitate regular updates to the existing inventory of online and hybrid courses as well as to the bibliography of articles related to technology-enhanced education. In addition, this group should coordinate its activities and consult regularly with those involved in the Digital Education Research Center proposed earlier in this Report. Finally, this group should take responsibility for the continued development and dissemination of the best practices that the Committee has identified (see III.2.e).

For experimentation to benefit faculty and students, good ideas need to spread, and apparently attractive but ineffective ideas need to be identified early and avoided in the future. NYU does not currently have a platform for identifying productive approaches to teaching that might have been developed in, say, Wagner but would be relevant in Tisch (or Stern/Medicine, Steinhardt/SCPS, NYU Abu Dhabi/NYU Prague). Committee members have reported that faculty who participate in group conversations about existing experiments are often surprised at the range and depth of work already going on. Such ad hoc gatherings, however, barely scratch the surface of even current experiments and will be increasingly inadequate as such experimentation grows. The risk is that local experiments will create local value but will not spread, leaving most NYU faculty members unable to benefit from the work outside their own schools and departments. The Committee believes that the proposed Digital Education Research Center and shared communication between school-based and University-level instructional technologists will serve to fill this communication gap.

Schools and departments should seek to promote progressive mastery of a range of digital tools and approaches across programs of study and curricula. To ensure that they can do so and to promote the development of skill-based competencies appropriate to their academic missions, the Committee recommends that NYU create physical as well as virtual spaces in which faculty, instructional designers, and technologists can collaborate and experiment across traditional boundaries of department, discipline, and unit. Especially in an institutional environment as diverse and decentralized as NYU, we need mechanisms and spaces for collaboration and experimentation—an incubation laboratory for designing and assessing technology-enhanced teaching and research for the 21st century.

CERTIFICATE IN DIGITAL HUMANITIES

New tools and methods for the design, analysis, and preservation of digital data are generating new kinds of collaboration between humanists and scientists. In light of the pressing needs and opportunities for fresh approaches to graduate training in the digital era, the Graduate School of Arts and Science is developing a new graduate professional certificate in digital humanities, in partnership with the Division of Libraries and Global Technology Services. Through practice-based teaching and flexible formats appropriate to NYU's global network, the certificate and related curricular and technology service design will offer graduate students across the school enhanced computational literacy in digital tools and methods; it will also foster project-based training in research and professional development.

RECOMMENDATIONS ON SECTION IV.3

Recommendation 7: Facilitate learning about available resources and the applications of instructional technology.

In support of this:

- Continue to assess and improve the Enhanced Service Model for Instructional Technology Support (ESMITS), which provides assistance at an institutional level for all instructors.
- Ensure that there is at least one instructional technologist based in every school and convene these individuals regularly with University-level IT staff to coordinate initiatives.¹⁴ This group should take responsibility for the following:
 - continuing to address emerging support needs through the evaluation and assessment of instructional technology services;
 - reconfiguring the Committee's website into an online clearinghouse of information and resources for the NYU community about technology-enhanced education;
 - regularly updating online resources (e.g., the FAQs, the inventory of online and hybrid/blended courses, and the bibliography of articles about technology-enhanced education); and
 - developing and disseminating, in collaboration with the proposed Digital Education Research Center, best practices for instructional uses of technology, especially standards for online courses.
- Create physical and virtual spaces where faculty, instructional designers, and technologists can collaborate and experiment with new technologies for teaching and research, particularly across units.

¹⁴ At the Committee's recommendation, the Provost has already made this request of the Deans. He has provided bridge funding to the schools for this purpose. Recruiting school-based instructional technologists is already underway.

4. INFRASTRUCTURE

(a) Classrooms and Learning Spaces. The University and its schools share responsibility for equipping and maintaining the spaces in which faculty teach. The University is in the final stage of a five-year, \$9.7 million upgrade to the 170 general purpose classrooms (GPC) at Washington Square, which can be used by faculty from all NYU schools and which are scheduled by Room Assignments. Over 90 percent of GPCs at Washington Square now meet the “smart classroom” standard.¹⁵ Similar significant investments have been made in creating state-of-the-art classrooms at the two portals, NYU Abu Dhabi and NYU Shanghai, as well as at the 11 global sites.

In addition to GPCs, faculty at Washington Square also teach in 131 proprietary spaces (mostly small seminar-style rooms) controlled by schools and departments. Technology varies widely in these proprietary spaces, many of which do not conform to the standards that have been developed to guide the equipping and maintenance of GPCs. As NYU units upgrade their proprietary spaces—not only at Washington Square but also at the portal campuses and global sites—it is essential that they consult with Classroom Media Services in the Division of Libraries, which can advise on University standards for classroom technologies.

Beyond the unevenness of its classrooms, NYU faces an additional challenge: Information about what is available in different parts of the University, both in New York City and at the portal campuses and global sites, cannot be reliably accessed and understood. Currently, for example, there is no system that faculty and students can access to locate available classrooms and learning spaces with specific technological enhancements, such as lecture capture or videoconferencing systems.

The new Space Management System, currently under development by the Office of Facilities and Construction Management, will eventually become the database of record for all University academic and administrative facilities worldwide. Once completed, the database could also potentially serve as the basis for an enterprise scheduling system, enabling NYU faculty across the global network to locate, reserve, and configure classrooms and learning spaces with the specific technological enhancements that they need. The Committee urges the University’s standing Teaching Technology Committee to monitor progress toward completing the system in a timely fashion.

¹⁵ The University has established standards for three “tiers” of classrooms to achieve maximum functionality and to introduce greater cost efficiencies. Tier I classrooms include the following features: wireless Internet access; a computer with Internet access and standard software (and, where appropriate, specialized software); inputs for additional devices; and built-in audiovisual capability. “Smart,” or tier II, classrooms include all of these features plus a centralized media control system, and some of these rooms may also have course-capture capability. Finally, tier III, or “videoconferencing,” classrooms have a synchronous videoconferencing connection with other locations in the global network.

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In the long term, it is inevitable that, as new instructional technologies evolve and are increasingly adopted by faculty, the current standard of “smart classrooms” will also need to evolve. Innovations in technology-enhanced learning may also reduce the need for certain types of classroom layouts (e.g., large lecture rooms), and create a need for others (e.g., small or midsize spaces). With this in mind, the Committee agrees with the observation made by the University Space Priorities Working Group in its recent report—i.e., that “newly designed classrooms offer NYU the opportunity to improve substantially the quality of instructional space and also to design more flexible space that can be adjusted from year to year to accommodate enrollment maximums and seating configurations.” The Working Group recommends building between 132,000 and 214,000 gross square feet of GPCs “to accommodate a variety of pedagogical styles.”¹⁶ The Committee would add to this recommendation that the University should consider the possible impact of new technology-enhanced pedagogies on the types of classrooms that are needed in the future. These classrooms should be thought of as learning spaces that contain an ever-expanding menu of teaching and learning activities. As with digital tools for teaching and learning, the Committee supports experimentation with different learning space designs. An example for such experimentation can be found in NYU’s new MAGNET facility at 2 MetroTech Center in Downtown Brooklyn.

(b) Bandwidth and Network Stability. As has been noted frequently, most recently by the FAS Policy and Planning Committee in a communication to the Provost (December 2013), wireless networks support a wide range of academic activities across NYU’s global network. Without reliable access to state-of-the-art wireless networks, faculty and students cannot derive full benefit from the range of electronic resources that the University provides and supports. In response to a number of reports by faculty and students of poor or interrupted wireless access in various NYU locations, ITS/GTS has taken the following steps to resolve this situation: (a) focusing the refresh program for Wi-Fi gear in New York City on rooms in which there have been issues with Wi-Fi capacity or coverage; (b) working with the council of schools’ chief information officers to encourage all NYU constituencies to adapt their schools’ infrastructure to the NYU networking standards and to report outages as quickly and as specifically as possible; and (c) exploring options for a rolling, active survey of classrooms (both GPCs and proprietary spaces) so that information about network outages or issues in classrooms can be shared across the units. The Committee strongly endorses these efforts.

¹⁶ *University Space Priorities Working Group Final Report* (March 2014), p. 22 and 25.

(c) The Global Network and Multilocal Teaching. NYU's global network offers unique and exciting opportunities to develop and deliver courses that link multiple locations through the use of new technologies. An example of one type of "linked" course is *Where the City Meets the Sea*, which was developed and co-taught by two NYU faculty members, a marine biologist (based in Abu Dhabi) and an environmental scientist (based in New York City) who has extensive experience using geographic information systems (GIS) software.¹⁷ This course, which debuted in spring 2012 in Abu Dhabi and New York City, was designed to be global in scope yet deeply invested in the specific locations in which it is offered. Thus, while the two linked class sections have a common syllabus and learning outcomes, each section is locally inflected to take advantage of regional opportunities for student research. Students not only use various technologies (e.g., GIS software, tablets, and air and water testing devices) to collect and compare data across the global network, but they and their instructors also meet regularly using videoconferencing equipment installed in classrooms in both locations.

Since the debut of *Where the City Meets the Sea* (which has subsequently been taught in Abu Dhabi, New York City, London, Sydney, and Shanghai), there has been significant interest among NYU faculty in using videoconferencing (VC) equipment to support "synchronous" (i.e., real time), collaborative teaching across the global network in many other disciplines. Currently, faculty can use over 20 VC-equipped classrooms (both GPCs and proprietary spaces) across NYU's portal campuses and global sites, and additional rooms are under development; these classrooms include a live link (audio, video, and

SPEAKING FREELY ONLINE

Created over 15 years ago in response to the University's initial focus on global education, *Speaking Freely* is a popular program that offers free noncredit, informal language instruction. While very successful, the program's in-person format has limited its usefulness to students who move across the global network. To address this need and to respond to university-wide discussions about technology-enhanced education, Global Technology Services and CAS (which administers *Speaking Freely*) have piloted an integrated language-learning platform to deliver the program online. Using licensed tools (e.g., Google Hangouts), this platform enables learners to register for coaching sessions and identify peer chat partners. In addition to supporting informal instruction, it has the potential of being used by instructors of formal language courses, e.g., to connect their students with native speakers for language practice. *Speaking Freely Online* will be launched in August 2014.

¹⁷ More information about this course is available [here](#).

“...the interface between technology and global education is a question that is particularly relevant to NYU. How might we enable our students to take full advantage of opportunities for study within NYU’s global network?”

shared media) between at least two and as many as four remote locations.¹⁸ To promote these activities, the University must ensure that there is a sufficient number of VC-equipped classrooms across the global network.

Another possibility for faculty to teach linked courses across the global network is through web conferencing. Depending on the size and format of the course, web conferencing may, in some cases, be a more appropriate means than videoconferencing for faculty to connect in real time with students in other NYU locations. Web conferencing tools available to NYU faculty include WebEx, Google Hangouts, and Big Blue Button (the last of which is currently being integrated into NYU Classes). Support and guidance should be provided to faculty who are interested in using any of these tools for synchronous multilocal teaching.

As noted in the introduction to this Report (see above, section I), the interface between technology and global education is a question that is particularly relevant to NYU. How might we enable our students to take full advantage of opportunities for study within NYU’s global network? Multilocal teaching by faculty can create more flexibility for students to study at other NYU locations; also, by linking these locations, it can realize further potential of the global network.¹⁹ With this in mind, the Committee notes that the Faculty Advisory Committee on NYU’s Global Network is issuing a report this summer. Our successor committee should review that report carefully, with an eye toward making recommendations about how departments and schools might consider using technology to support their students and the academic pathways that their faculty have developed at our sites.

¹⁸ For a complete list of VC-equipped classrooms, see nyu.edu/its/videoconferencing.

¹⁹ Other possibilities for creating flexibility include digitizing lectures and/or course materials for use at multiple sites; sites (see section IV.1.a).

RECOMMENDATIONS ON SECTION IV.4

Recommendation 8: Ensure that the development and renovation of classrooms and learning spaces takes into consideration both current and potential uses of technology in teaching and research.

In support of this:

- Take into account, when developing new general purpose classrooms, the ways in which the increasing use of instructional technology will shape the University's needs for teaching space (i.e., small or midsize spaces with state-of-the-art equipment, rather than large lecture halls).
- Support experimentation with the design of new teaching and learning spaces and evaluate their impact on student learning and on instructor and student satisfaction.
- Require departments and schools (including portal campuses and global sites) as they create new proprietary spaces or renovate existing ones to do so in consultation with Classroom Media Services in the Division of Libraries and in accordance with standards developed for technology in general purpose classrooms.
- Expedite completion of the Space Management System project.
- Continue to update and improve the technological infrastructure (e.g., bandwidth, stable wireless networks) on which many academic activities at NYU depend.

Recommendation 9: Explore and support multilocational teaching by faculty across NYU's global network.

In support of this:

- Develop additional videoconference-equipped classrooms (both general purpose classrooms and proprietary spaces) throughout the global network and provide instruction and staff support for the allocation and use of these spaces.
- Provide pedagogical guidance and technical support for the use of web conferencing as a tool for teaching across NYU locations.

V. CONCLUSION

1. OVERVIEW

This Report summarizes the work of the Committee over three semesters, during which time the members discussed the ways in which technology can help universities in general, and NYU in particular, address a number of pressing goals. These goals include, among others, improving students' learning outcomes, promoting and enhancing global education, increasing access to higher education, mitigating risks, and reaching new constituencies.

In its deliberations, the Committee was guided by four principles. First, innovation in technology-enhanced education is driven by faculty (both as individuals and within departments and schools) and takes place within the framework of faculty governance. Second, the University should encourage and support faculty experimentation with technology-enhanced education toward a variety of goals. Foremost among these should be improving teaching and learning (though there are other NYU-specific goals as well, such as facilitating students' studying at multiple locations in our global network). Third, the University should evaluate the impact of these diverse experiments on students' learning outcomes. And finally, faculty should communicate their findings with colleagues across the NYU community, with the possible result that, over time, some university-wide strategies may emerge in this area.

During the three semesters in which it met, the Committee also took a number of concrete steps to engage and support NYU faculty in exploring the educational possibilities that new technologies create. On the basis of these conversations, as well as its own deliberations, the Committee made a set of specific recommendations for future action. But since the Committee had a limited time frame in which to work, it was unable to recommend strategies for resolving all of the issues that it had identified. For this reason, one of its most important recommendations is that a standing committee be established which can pursue these issues further. The members of this new committee should review the recommendations contained within this Report. Their deliberations should also be informed by other concurrent university-wide conversations that resonate with technology-enhanced education, such as those that pertain to learning outcomes assessment, space planning, and the global network.

As noted in the introduction to this Report, this is an exciting and important moment in the history of education. NYU has already made significant progress in a number of areas related to technology-enhanced education, and with further effort, it will be poised to take a leadership role among its peer institutions. The Committee looks forward to a robust conversation of this Report in the fall 2014 semester, which will begin with a conference in September, which the Committee has organized on the theme of "Beyond the Year of the MOOC: Beginning a Conversation about Technology-Enhanced Education at NYU."

If you have any comments on this Report, we invite you to send them to the following email address: tech-enhanced-education-group@nyu.edu.

2. COMPLETE SET OF RECOMMENDATIONS

EXPERIMENTATION, RESEARCH, AND EVALUATION

Recommendation 1: Encourage individual faculty members, departments, and schools to experiment with technology-enhanced approaches to teaching, learning, and research.

Recommendation 2: Conduct research on and evaluate which technologies enhance student learning outcomes, for which subject areas, and under which conditions.

In support of the above:

- Establish a competitive grant, along the lines of the existing Curriculum Development Challenge Fund, to support faculty who want to explore creative uses of technology in their courses; develop a set of criteria for evaluating submissions.
- Refrain from making high-level university-wide decisions at the present time about partnerships with MOOC consortia and full-service online providers, but continue to allow individual schools to pursue such relationships in consultation with the Provost. (Commitments with MOOC consortia should occur at the course level, and then only through the appropriate faculty governance mechanisms.)
- Develop NYU-specific versions of Open Education that make use of social media and video lectures; encourage development of peer-to-peer Open Education projects.
- Establish a Digital Education Research Center, with start-up funding over a three- to five-year period, to facilitate faculty research into technology-enhanced education, to disseminate research conducted here and elsewhere, and to serve as a resource for interested faculty.
- Ensure that any technology-enhanced course supported by the University is assessed in terms of its impact on student learning, motivation, and related outcomes.
- Review individual schools' initiatives in technology-enhanced education to determine if a University-level strategy emerges, and prepare the University to respond to both challenges and opportunities that arise in this area.

GOVERNANCE AND POLICIES

Recommendation 3: Ensure broad-based input into decision making about technology-enhanced education.

In support of this:

- Create a new standing committee to advise the University's decision making in this area. This committee should include one faculty member from each NYU school as well as representation from the Tenured and Tenure-Track Faculty Senators Council, the Full-Time Non-Tenure-Track/Contract Faculty Senators Council, and the Student Senators Council. In addition, instructional technology experts from ITS/GTS and the schools should be invited to join the meetings on an ex officio basis.
- Consult broadly with faculty, students, and staff on all matters regarding technology and education, using a variety of strategies, such as crowdsourcing, town halls, etc.

Recommendation 4: Encourage schools, working through their faculty governance mechanisms, to review any restrictions they may have concerning students' ability to use technology-enhanced courses to fulfill program and degree requirements.

Recommendation 5: Circulate widely the relevant intellectual property and conflict policies (*Conflict of Interest and Conflict of Commitment*); review them continuously to ensure that they reflect the emerging best practices for online works; and ensure that faculty members understand their rights with regard to the resulting work.

Recommendation 6: Resolve key questions about data stewardship to ensure that there is clarity about policies governing the use and management of the data generated by instructional technologies.

SUPPORTING AND EDUCATING THE COMMUNITY

Recommendation 7: Facilitate learning about available resources and the applications of instructional technology.

In support of this:

- Continue to assess and improve the Enhanced Service Model for Instructional Technology Support (ESMITS), which provides assistance at an institutional level for all instructors.

- Ensure that there is at least one instructional technologist based in every school and convene these individuals regularly with University-level IT staff to coordinate initiatives.²⁰ This group should take responsibility for the following:
 - continuing to address emerging support needs through the evaluation and assessment of instructional technology services;

 - reconfiguring the Committee's website into an online clearinghouse of information and resources for the NYU community about technology-enhanced education;

 - ensuring that online resources (e.g., the FAQs, the inventory of online and hybrid/blended courses, and the bibliography of articles about technology-enhanced education) are regularly updated; and

 - developing and disseminating, in collaboration with the proposed Digital Education Research Center, best practices for instructional uses of technology, especially standards for online courses.

- Create physical and virtual spaces where faculty, instructional designers, and technologists can collaborate and experiment with new technologies for teaching and research, particularly across units.

²⁰ At the Committee's recommendation, the Provost has already made this request of the Deans. He has provided bridge funding to the schools for this purpose. Recruiting school-based instructional technologists is already underway.

INFRASTRUCTURE

Recommendation 8: Ensure that the development and renovation of classrooms and learning spaces takes into consideration both current and potential uses of technology in teaching and research.

In support of this:

- Take into account, when developing new general purpose classrooms, the ways in which the increasing use of instructional technology will shape the University's needs for teaching space (i.e., small or midsize spaces with state-of-the-art equipment, rather than large lecture halls).
- Support experimentation with the design of new teaching and learning spaces and evaluate their impact on student learning and on instructor and student satisfaction.
- Require departments and schools (including portal campuses and global sites), as they create new proprietary spaces or renovate existing ones, to do so in consultation with Classroom Media Services in the Division of Libraries and in accordance with standards developed for technology in general purpose classrooms.
- Expedite completion of the Space Management System project.
- Continue to update and improve the technological infrastructure (e.g., bandwidth, stable wireless networks) on which many academic activities at NYU depend.

Recommendation 9: Explore and support multilocal teaching by faculty across NYU's global network.

In support of this:

- Develop additional videoconference-equipped classrooms (both general purpose classrooms and proprietary spaces) throughout the global network, and provide instruction and staff support for the allocation and use of these spaces.
- Provide pedagogical guidance and technical support for the use of web conferencing as a tool for teaching across NYU locations.

APPENDIX A

COMMITTEE CHARGE

Faculty Committee on the Future of Technology-Enhanced Education at NYU

The charge for this group is to set forth principles and parameters that can guide the University in using technology to support its academic mission and further its commitment to innovation in teaching and learning, pedagogical practices, and research.

To that end, the group will consult broadly with faculty, students, and other members of the NYU community as well as external leaders in educational innovation.

Among the questions that the group should address are the following:

- how can we best provide support to faculty who choose to use instructional technology to enhance the quality and effectiveness of their teaching;
- how can instructional technology be used to create a more dynamic and effective environment for teaching and learning that is beneficial to all members of the educational community;
- how can instructional technology enrich learning communities within and across NYU's global network (e.g., by developing platforms and pathways for collaboration and experimentation);
- whether and how might the University use technology-assisted courses to engage new constituencies;
- what impact might new instructional technologies have on the flow of revenue;
- how might the application of new technologies be used to address the question of access to higher education; and
- how can and should the application of new instructional technologies (including formative and summative techniques of evaluation) be used to assess best practices in teaching and learning?

On the basis of these conversations, the group will prepare a written report for the University's Teaching Technology Committee, which will disseminate it widely for consideration across various units of the University and will then prepare a final recommendation to the President and Provost.

APPENDIX B

INTERIM REPORT (JULY 2013)

I. INTRODUCTION

The Faculty Committee on the Future of Technology-Enhanced Education at NYU was formed by President Sexton and Provost McLaughlin in December 2012. The members of the committee were appointed in consultation with all the Deans and the Faculty Senators Council; the committee is very broadly representative of NYU schools and includes three Faculty Senators. The committee's charge was to set forth principles and parameters that can guide the University in using technology to support its academic mission and further its commitment to innovation in the service of excellence in teaching and learning, pedagogical practice, and research.

Co-chaired by Rick Matasar (Vice President for Enterprise Initiatives; SCPS) and Matthew Santirocco (Senior Vice Provost for Undergraduate Academic Affairs; FAS, Classics), the committee began meeting in January 2013 and met eight times over the course of the spring semester, including an extended final meeting in mid-May. (Meeting summaries and minutes can be found online on the committee's [website](#).)

It should be noted that this period witnessed an explosion of activity worldwide in the area of technology-enhanced education (hereafter TEE), particularly online courses and programs. Some universities' forays into online education have encountered strong criticism from faculty, who have felt disengaged from the decision-making process. Rather than being discouraged by the experiences of those institutions, we believe that they validate the deliberate and broadly consultative approach that we are taking. We also recognize that, while we engage in this deliberative process, we should encourage experimentation and pilot projects in order to inform the strategic choices that will ultimately be made by the faculty and deans of each school.

In what follows, we offer a brief overview of the actions that were taken (section II, "Actions"), make a number of observations and recommendations, based on the discussions that took place in our meetings (section III, "Observations and Recommendations"), and summarize our plans for next year (section IV, "Next Steps").

II. ACTIONS

The actions taken by the committee this semester were as follows:

1. Committee Website: In mid-February, a [website](#) was created, with both public components (charge, membership, and meeting schedule) and password-protected components accessible to all members of the NYU community (meeting summaries and minutes, an inventory of current online and technology-enhanced courses and programs at NYU, and selected literature on technology and education).

2. Consultation: Also in mid-February, the committee sent an email update to the NYU faculty, announcing that plans for consulting the University community were under development and inviting colleagues to submit comments through the committee's website or directly to individual committee members.

In late February, a Subcommittee on Faculty Consultations and Engagement (chair: Gigi Dopico-Black, FAS Spanish and Portuguese) was created to develop strategies for consulting with faculty about TEE (see section III.2: "Consultation Process").

In April, Rick Matasar and Matthew Santirocco asked the Deans to identify the most appropriate venues in their schools for in-person faculty consultations. All of the Deans' replies were forwarded to the subcommittee.

Finally, in mid-April, Rick Matasar and Matthew Santirocco met with the University Committee on Student Life to get student input. The students expressed a strong desire to be represented on the committee, whether as observers, members of subcommittees, or plenary committee members. The committee will discuss this matter when it resumes its deliberations in September.

3. Best Practices: In April, a second subcommittee, on Best Practices for Teaching and Learning in the 21st Century (chair: Tom Augst, FAS English), was created to synthesize current knowledge and identify research needs in the design and assessment of TEE. The work of this subcommittee will be key to the faculty consultations that the committee will begin in the fall (see section III.2: "Consultation Process").

4. Course and Program Inventory: In June, Global Technology Services (GTS) completed the process of documenting the existing online and hybrid/blended courses and programs that NYU schools have mounted; the updated inventory now includes over 300 credit-bearing courses. The majority of these are offered by Law, NYU-Poly, SCPS, and Stern. Many have been in place for a number of years. They use a wide variety of technological

enhancements and provide a backdrop against which new initiatives can be measured. Although most courses in the current inventory are offered in graduate programs, a few are offered to undergraduates (e.g., in the McGhee Division). Over the summer, the inventory will be updated further to include several hundred additional non-credit courses, both tuition-based and publicly available (the latter on multiple platforms, e.g., YouTube Edu and iTunes U).

III. OBSERVATIONS AND RECOMMENDATIONS

As our newly revised inventory reveals, there is already a great deal happening at NYU in the area of TEE. The focus of this committee, however, is on the future of TEE at NYU. With this in mind, the committee makes the following preliminary observations and recommendations:

1. Faculty Support: There was consensus within the group that there is a broad continuum of TEE, stretching from in-person lecture courses and seminars with digital enhancements, to “flipped classes” that deliver lectures or other “content” online and reserve in-class time for discussion, to fully online courses, as illustrated below:

| TEE CONTINUUM | | | | | | |
|---|---|--|---|----------------------------------|--|-------------------------------------|
| Credit-Bearing | | | | | | Non-Credit |
| Traditional | Hybrid | | | | Digital | |
| Traditional classroom (lectures and readings) | Traditional class with digital enhancements (e.g., supplemental instruction, ePortfolios) | Flipped class (lecture online, in-class interaction & exercises) | Hybrid course with multiple global classrooms | Hybrid course with peer tutoring | Fully online course (with proctored exams) | Massively open online course (MOOC) |

Committee members agreed that NYU faculty would benefit from a better understanding of the various technological enhancements that are possible at all points on the continuum, and that NYU (both at the University and at the school level) should continue to explore activities at different points along the continuum and then support those that the faculty and Deans of each school believe would best serve their respective educational missions.

Currently, however, the support that exists at NYU for all types of TEE is extremely uneven. At the University level, faculty support for TEE is primarily offered by the Digital Studio, which is staffed by a joint Libraries and Information Technology Services (ITS) group. GTS also provides significant expertise in the use of instructional technology. But there is still confusion among faculty about which University units to approach about specific requests. Until recently, there has also been confusion both within and among these units, which have often operated in silos, without a common knowledge base or a common set of service descriptions that could facilitate referrals. In addition, there has not been a venue where faculty could exchange ideas about TEE. Finally, the Center for Teaching Excellence (CTE) as part of its mission to nurture effective teaching and learning at NYU, can play a greater role in connecting faculty with instructional technology support, and its activities should be better coordinated with the units that provide services in this area.

Similar issues exist at the school level, where there is great unevenness in the support that is provided to faculty. Some schools invest heavily in this area; while others have historically invested relatively little. Given the lack of TEE support within many schools, the support provided at the University level will not be enough to meet the needs of the increasing numbers of NYU faculty who want to innovate and experiment with instructional technology.

The committee recommends that this situation be addressed. To that end, we note that an affinity group has been created, led by Ben Maddox (Associate Vice President for Global Technology), and consisting of representatives from the Libraries, ITS, GTS, and the CTE. With the oversight of Carol Mandel (Dean of Libraries), Marilyn McMillan (Vice President for Informational Technology and CITO for NYU NY), Tom Delaney (Vice President for Global Technology), and Cybele Raver (Vice Provost for Academic, Faculty, and Research Affairs), this affinity group is developing an approach to coordinating and enhancing the TEE-related services that the University provides through its offices. In addition, a fundamental part of this process will be to determine which responsibilities for providing TEE support to faculty lie with the individual schools, which lie with the University, and how to coordinate across the institution.

2. Consultation Process: The Subcommittee on Faculty Consultations and Engagement agreed that the process of consultation should be robust and meaningful and that it should make simultaneous use of several avenues: some already existing venues (e.g., departments or divisions, standing committees, Faculty Senators Council, DUS and DGS meetings, Deans' and general faculty meeting) and other new, ad-hoc venues (e.g., town hall meetings, online surveys or polls, etc.). By fall 2013, the subcommittee will make recommendations for various modes of faculty consultation to the full committee, and visits will begin shortly thereafter.

As noted in (section II.3, “Best Practices”), the work of the Subcommittee on Best Practices for Teaching and Learning in the 21st Century will be key to this consultation process. In the spring, the subcommittee drafted forty recommendations pertaining to effective learning and innovative teaching at the course, school, and University level, outlining priorities that might guide the development of classroom tools, the evaluation of student competencies and learning outcomes, and the engagement of faculty in the development of curricula and pedagogy. It also drafted FAQs for use in faculty consultations. Both documents will be refined before being shared during the consultation process in the fall. While elaborating and disseminating recommendations about how technology can facilitate new ways of learning, this group will seek in the coming year to advance NYU’s global leadership in the design of technology-enhanced education by engaging the entire University community in conversations about what it needs to teach and learn at a GNU in the 21st century.

As part of its concerted, community-wide consultation efforts, the committee has also expressed interest in organizing workshops on the use of instructional technology, both broad-based and tailored to teaching objectives within specific areas (e.g., humanities, social sciences, natural sciences). One possibility might be to ask the CTE to organize a conference on teaching with technology, in late fall or early spring, along the lines of the successful (and well-attended) February 2012 conference, which was co-sponsored by the CTE and the Teaching Technology Committee. Such an event would enable NYU faculty to continue to learn from their colleagues about the range of possibilities within TEE. These events are important, but more permanent venues for faculty exchange around TEE are also necessary.

Finally, in addition to in-person consultations, the committee expressed an interest in exploring the strategic use of crowdsourcing in its outreach to the NYU community. Crowdsourcing is a new technique for soliciting input electronically from large numbers of people, including those who might not otherwise have an opportunity to participate in a particular discussion. It is not a mechanism for making decisions, but rather a potentially effective method for informing such decisions. The committee will take this up at its first meeting in the fall.

3. Pilots: The committee recognizes the need for experimental initiatives at NYU across the TEE continuum. Such pilots can give us a better understanding of how “best practices” in TEE can be realized. The primary goal of these pilots should always be to enhance teaching and learning, including assessment. But in addition, some of them might also serve other goals, such as promoting flexibility in terms of time and space (e.g., for students who are studying abroad, holding down jobs to earn money, or pursuing internships or other experiential learning or clinical training opportunities); increasing access to NYU (e.g., by offering qualified students

unable to attend NYU in person a way to begin their studies through technology-enhanced courses); and/or furthering the University's Open Education efforts, which not only provide a free service to the public but also promote NYU's academic excellence and may even help to recruit students. These diverse goals spurred an important discussion among the committee, with members having varying opinions about them.

We believe strongly, however, that four conditions must be attached to these pilots:

- First, consistent with the best practices identified by this committee, whatever is done online must be of the highest possible quality.
- Second, schools, departments, and individual faculty should be invited but *not* obliged to participate in this initiative. No school or department should be required to develop or to award credit for online courses if its faculty does not support doing so; the committee recognizes that what works for one school will not necessarily work for another.
- Third, any project supported by the University should include a development/research/evaluation component that would allow faculty to draw more than anecdotal conclusions about the project's impact on student learning, motivation, and related outcomes. This component would serve as a guide not only for the developer, enabling faculty and students to improve upon the project as it is created, but also for the eventual users of the project (who will want to know if the project accomplishes what it was designed to do).
- Finally, and most importantly, for any of these pilots to be offered for credit, existing faculty governance and course or curriculum approval mechanisms within the departments and schools must be followed. While this committee can provide guidance to the schools about the range of options that exist and about best practices in TEE, it is faculty who are ultimately responsible for deciding which directions their schools will take in this area.

4. Open Application Process: Over the past academic year, several faculty members, departments, and schools have asked for and received support for developing online and hybrid/blended courses. While these pilot projects began before the committee was appointed, they reflect many of the goals for pilots noted above and are being implemented to adhere to the four conditions that the committee has attached to these projects (see section III.3: "Pilots"). The committee recommends that these faculty- and school-generated pilots be completed. But for the future, it may be advisable to establish, at the University and/or school level, an open and transparent application process for soliciting and vetting proposals from individual faculty, departments, or schools for online and hybrid/blended courses.

When the committee resumes meeting in September, it will discuss criteria that may be used to select projects for development, and will discuss the appropriate process and venue for selection (the latter may or may not be this committee).

5. Platform: For the purposes of this report, we use the term “platform” to describe the undergirding technology that supports the University’s teaching and learning needs. NYU Classes, the University’s new, Sakai-based learning management system (LMS), is a flexible, open-source platform that facilitates faculty innovation at multiple points along the TEE continuum. Integrated with the University’s login services and its student information system (SIS), the NYU Classes platform serves as a user-centered “front-door” to a wide range of digital teaching tools that can either be developed or hosted there. The University’s partnership with Amazon EC2 cloud services, for example, will allow for future innovation in TEE tools that can be scaled and deployed globally. The range of activities that the NYU Classes platform could potentially support is vast. Faculty could, for example, engage students in web chats or synchronous video, adaptive assessments, or interactive animations and simulations. A model could potentially be manipulated in 3D space, tagged with notes and discussions, all during a real-time web video chat. Further along on the continuum, the University is also exploring how to extend the NYU Classes platform to develop the kinds of technological enhancements that can support fully online courses. Finally, the committee recognizes that enhanced learning analytics will be increasingly important to our community, which includes a rich diversity of learners and learning styles. This should also be a priority for the future development of the NYU Classes platform.

6. MOOCs: Over the past several months there has been extensive discussion internationally about “massive open online courses” (MOOCs). These online courses provide a way of reaching significantly larger numbers of students and of extending the global reach of academic programs, thus providing a showcase for institutions’ teaching excellence. The committee has not yet expressed a view on whether NYU should offer MOOCs, and opinions vary among the members. But it does not think that it is necessary at this time to make a University-wide commitment to offering MOOCs. This discussion will be continued next year. In the meantime, schools should continue to explore their own strategic approaches to this question.

Although the committee does not yet have a recommendation about whether to make a University-wide commitment to MOOCs at this time, the committee believes that the University should continue to explore ways of offering an Open Education experience at NYU. One of these might be to produce relatively short, open, online experiences aimed at drawing current or potential students into courses and programs at NYU. These experiences would engage students in interactive, immersive activities, using puzzles,

paradoxes, and intellectual content as gateways into NYU programs in which students could explore the subject more fully. Such open, online experiences could last anywhere from a few minutes to a few hours and would be an invitation to deeper learning and a chance to highlight the diverse faculty and curricular options across the schools and departments of NYU. Faculty and academic advisors could point to these online experiences as resources for students to explore as they consider new intellectual venues.

7. Partners: There are two types of relationships that various institutions have been entering into in their efforts to build and market online courses: (a) joining a consortium of schools (e.g., Coursera, which is for-profit, and edX, which is non-profit); or (b) partnering with a full-service online provider (e.g., 2-U, Pearson Embanet).

(a) *Consortia:* Many well-regarded colleges and universities have joined consortia to help them develop and distribute MOOCs. The proponents of such consortia note their substantial benefits: the pioneering use of adaptive learning approaches that allow students to learn in ways most appropriate to their learning styles, the ability for students to learn at their own pace, and the varied new ways in which colleagues can collaborate. Without passing on the legitimacy of various concerns about these consortia, the Committee notes that they have been criticized for: (a) not providing for deep interaction between faculty and students; (b) having been driven by top-down decisions from university administrators; (c) failing to offer meaningful evaluations of many students; (d) being focused on providing content and not on learning; (e) having no sustainable business model; and, (f) if they involve efforts to market courses or services for a fee, taking a disproportionate share of that fee.

(b) *Full-service online providers.* These companies have engaged in partnerships with several universities to build, host, and market online degree and certificate programs. Such providers (typically large, for-profit companies, and, increasingly, academic book publishers) regularly approach the NYU administration, as well as individual schools and departments, about entering into relationships in which they would provide these types of services for specific academic programs, in exchange for a share in the revenue that the programs generate. Several high-profile universities have already established such partnerships, which have led to significantly increased enrollments and enhanced revenue for their programs. These partnerships have been criticized for a number of reasons—e.g.: (a) for ceding academic control to for-profit entities whose foremost concern may not be educational quality; (b) for giving an excessively high percentage of the proceeds to the providers; (c) for relying on substandard tools; and (d) for having primarily financial, rather than educational aims.

The committee believes that before these types of broad institutional commitments can be made, a clear set of strategic objectives needs to be identified by NYU. This must involve extensive consultation with schools, departments, faculty, and students, a process which will not begin in earnest until the fall. In the meantime, however, the committee believes that individual schools should be free to explore (in consultation with the Provost) whether to enter into such partnerships, since these may enable them to meet school-specific strategic and financial goals. (Non-degree programs, for example, might benefit from the kinds of distribution channels or other services that such providers can offer.) But these decisions, like all decisions regarding TEE, must be made through the school-based and faculty-governed processes.

8. Compensation: Late in the spring, Rick Matasar presented to the committee for informational purposes a tentative set of guidelines that had been developed to deal with faculty compensation, in load and out of load, for demonstration projects begun before the committee had been appointed. In addition, he reported on the University's current intellectual property rules and discussed the process by which these are being reviewed by a faculty committee. The Deans will be discussing compensation issues with the Provost over the summer and into the fall. We recommend that individual schools that currently offer online and/or hybrid/blended courses be free to develop or retain their own compensation policies for faculty who teach these courses (e.g., teaching relief, additional monetary compensation). We anticipate that Rick will report back to the committee on this matter in the fall.

IV. NEXT STEPS

The committee's primary objectives in the fall are as follows: (a) to have robust and meaningful consultations with the NYU community, through in-person meetings but possibly also using electronic means, such as crowdsourcing; (b) to organize workshops and/or a conference to enable the community to learn more about the potential for the use of technology in teaching and learning; (c) to develop a process for soliciting (through an open application) and vetting proposals for online and hybrid/blended courses from individual faculty, departments, or schools; and (d) to continue to refine strategic goals and pilots for technology-enhanced education.

The committee expects that its final report will be ready shortly after the end of the fall semester.

Respectfully submitted,

**Faculty Committee on the Future of
Technology-Enhanced Education at NYU**

APPENDIX C

LIST OF CONSULTATIONS WITH THE NYU COMMUNITY

| Unit | Venue | Committee participant(s) | Date(s) |
|--------------------------|--|---|----------|
| Arts and Science | FAS Chairs meeting | Gigi Dopico-Black | 10/08/13 |
| | Undergraduate Curriculum Committee (UCC) meeting | Gigi Dopico-Black | 11/11/13 |
| | Directors of Undergraduate Studies (DUS) meeting | Tom Augst, Gigi Dopico-Black | 11/20/13 |
| | Directors of Graduate Studies (DGS) meeting | Tom Augst | 11/20/13 |
| | FAS Chairs meeting | Gigi Dopico-Black, Matthew Santirocco, Peter Schilling | 12/10/13 |
| | GSAS Working Group on the Digital Humanities | Tom Augst, Dan O'Sullivan | 12/13/13 |
| Board of Trustees | Committee on Online Education and Technology | Full committee | 04/10/14 |
| Courant | Special faculty meeting | Richard Cole, Carol Hutchins | 11/08/13 |
| Dentistry | Dentistry Executive Management Council | Joyce O'Connor, Barbara Krainovich-Miller, Rick Matasar | 10/02/13 |
| | Dentistry Executive Management Council | Joyce O'Connor, Barbara Krainovich-Miller | 11/06/13 |
| | Dentistry Executive Management Council | Joyce O'Connor, Barbara Krainovich-Miller | 12/04/13 |
| Faculty Senators Council | Administration and Technology Committee meeting | Mark Alter, Carol Hutchins, Ted Magder, Victoria Stanhope | 12/03/13 |
| | Plenary meeting | Mark Alter | 01/30/14 |

FACULTY COMMITTEE ON THE FUTURE OF
TECHNOLOGY-ENHANCED EDUCATION AT NYU

| | | | |
|-----------------|---|---|--|
| Gallatin | Faculty affinity groups | Meetings were with instructional technologists from Global Technology Services. | 05/17/14, 05/08/14, 05/13/14 |
| GIPH | Various meetings with Deans Heaton, Thomas, and Halkitis (to discuss online GIPH core course certificate development) | Joyce O'Connor, Rick Matasar | 4/24/2013, 05/03/13, 07/19/13, 07/23/13 |
| | Faculty meeting | Joyce O'Connor | 09/17/13 |
| IFA | Special faculty meeting (following regular faculty meeting) | Mike Beckerman | 11/05/13 |
| Law | Online Education Committee meeting | Josh Blank | 10/08/13 |
| Liberal Studies | Joint meeting of the Steering Committee and the Technology Advisory Group | Patricio Navia | 12/06/13 |
| Libraries | Faculty meeting | Carol Hutchins, Mark Alter, Dan O'Sullivan | 11/15/13 |
| Medicine | Institute for Innovations in Medical Education; regular meetings of faculty and student stakeholders | Marc Triola | Biweekly, ongoing |
| Nursing | Nursing Dean's Leadership Coordinating Council meeting (to which additional faculty were invited) | Barbara Krainovich-Miller, Rick Matasar, Matthew Santirocco | 11/12/14 |
| | Simulation and Technology Committee meetings | Ben Maddox, Peter Schilling | 11/12/13, 04/09/14 |
| | Meeting of the Executive Associate Deans regarding faculty development | Barbara Krainovich-Miller, Peter Schilling | 04/21/14 |
| | Faculty development session | Peter Schilling | 04/21/14 |

FACULTY COMMITTEE ON THE FUTURE OF
TECHNOLOGY-ENHANCED EDUCATION AT NYU

| | | | |
|-----------------------------------|---|--|-------------------------------|
| Polytechnic School of Engineering | Meeting with the Dean and faculty leaders about online programs | Rick Matasar | 05/13/13 |
| SCPS | Faculty meeting | Shankar Prasad, Lisa Springer | 12/12/13 |
| Social Work | Faculty Lunch | Victoria Stanhope | 10/28/13 |
| Steinhardt | Faculty meeting | Jan Plass, Mark Alter, Ted Magder, Russ Neuman | 10/21/13 |
| Stern | Joint meeting of the Faculty Council, the Academic Programs and Teaching Resources Committee, and Vice Dean Adam Brandenburger's team | Aswath Damodaran, Rick Matasar | 11/04/13 |
| Student Senators Council | University Committee on Student Life | Rick Matasar, Matthew Santirocco | 04/11/13 |
| Tisch | Individual meetings with 12 Department Chairs (with Deputy Dean Ken Tabachnik) | Dan O'Sullivan | Between 08/15/13 and 09/06/13 |
| | Chairs meetings | Dan O'Sullivan | 09/12/13 |
| | | Dan O'Sullivan | 10/17/13 |
| Wagner | Faculty meeting | Shankar Prasad | 10/07/13 |
| | Meeting with GovLab capstone student group | Rick Matasar, Matthew Santirocco, Shankar Prasad | 05/01/14 |

APPENDIX D

“BEST PRACTICES FOR INSTITUTIONAL SUPPORT OF TECHNOLOGY-ENHANCED EDUCATION” (DECEMBER 2013)

Build experimental culture around technology-enhanced education that improves learning outcomes for students appropriate to their needs and opportunities at NYU.

Professional Development and Support

1. Reward effective teaching and establish incentives within merit evaluation to encourage innovation.
2. Redefine faculty workload with respect to technology-enhanced courses, and clarify faculty intellectual property issues.
3. Educate faculty and teaching assistants by identifying and collecting examples of innovative instruction and by showcasing teaching experiments on a regular basis.
4. Ensure that faculty have the support of professional staff (e.g., librarians, instructional technologists, videographers, programmers, animators, and Graphic Information Systems and statistics specialists) as they develop course content. Create a DIY space for faculty to make their own videos and other media-rich content.
5. Facilitate collaborations among faculty, instructional technologists, and IT staff to allow for team-based development of courses, department/program curricula, and course-related research projects.

Curricular Development and Assessment

6. Use technology to meet the curricular needs of current and future NYU faculty and students across the global network.
7. Support research-based design and assessment of technology-enhanced pedagogy across spectrum of hybrid and online formats of student learning.
8. Acknowledge the evolving and ongoing nature of course development. Regard unsuccessful experiments as learning opportunities and collect/share information on faculty efforts to inform ongoing experiments. Plan for regular course updates and improvements based on built-in course assessment.
9. Endorse student-centered alternatives to lecture-based instruction, e.g., reorienting how courses and curricula are delivered to focus on student progress toward subject mastery and acquisition of core competencies.
10. Encourage cooperation among schools and departments to minimize redundancies in instructional offerings.

APPENDIX E

“BEST PRACTICES FOR COURSE DESIGN AND INSTRUCTION” (DECEMBER 2013)

A. In-Person, Hybrid, or Online Courses

Innovative Pedagogy

1. Align student activities and assessments with desired learning outcomes and articulate up front the knowledge, skills, and attitudes that students should have after successfully completing the course.
2. Incorporate instructional approaches, formats, techniques, and tools that are current and informed by research, such as project-based, active, and multimodal learning.
3. Spend classroom time teaching methods, concepts, skills, and practices, rather than facts.
4. Support students' need for computational literacy to help them to master technical skills as well as to think and identify and answer questions in the context of contemporary tools and resources.
5. Provide immediate feedback. (The more immediate the feedback, the more effective it is in aiding students' learning.)

Authentic and Reflective Learning Experiences

6. Introduce students to tools and skills integral to analyzing data and contextualizing course themes, and offer rich opportunities for student engagement, problem solving, and research.
7. Promote self-reflection and allow for students' personalization of the subject matter, such as location-based fieldwork as well as other hands-on activities.
8. Promote student use of learning portfolios.

Student-Centered Course Development and Instruction

9. Encourage and provide tools to support student discussion and collaboration.
10. Scaffold learners with diverse skills, learning styles, and knowledge levels (i.e., offer differentiated instruction, giving novice learners information and support they need without slowing down advanced learners, who can go right to what they need).

Assessment

11. Promote continued and distributed learning, not “cramming”—e.g., by incorporating more low-stake quizzes, cumulative tests, individual or group projects, writing, and portfolios supported by rubrics.
12. Use multiple approaches—e.g., machine grading (multiple choice, numerical computations), including the use of Scantron item test banks and of “clickers” (to assess students’ understanding of concepts as they are being presented); instructor grading (open-ended responses); peer grading and “teach-back” strategies; self-assessment; multimodal activities (to address different learning preferences); and assessments embedded both within and after modules.
13. Incorporate both formative assessments (i.e., gathering feedback from students that can be used to guide improvements) and summative assessments (i.e., measuring the level of success or proficiency in the subject matter at multiple points during a course, as well as at the end).

B. Components That Can Increase the Effectiveness of a Hybrid and/or Online Course

Data-Driven Design and Analytics

1. Incorporate learning analytics of student performance, evaluations, and observable actions to inform the design of the learning experience, content, and student interactions.

Attention to Online User Interface/Experience

2. Conceptualize and design instructional digital materials and online platforms with a focus on the cognitive experience of the learner—ensuring, for example, that the navigation is intuitive, that there is a balance between text and graphics, that the visuals do not hinder the learning process, that there is sufficient “white space,” that fonts and layouts are consistent, that information is “scannable” to the eye, and that content is appropriately “chunked.”

Communication

3. Incorporate multiple approaches to communication—for example:

- Video—using short segments (two to five minutes) in a variety of formats, with audio narratives (to enable students to follow instructors as they move across lists, illustrations, and charts) and searchable transcripts (to facilitate review);
- Graphic animations—particularly for information that is visual, dynamic, three-dimensional, or spatial;
- Interactive simulations, gaming, and virtual worlds—using simulation, modeling, and forecasting to enhance explorations of real-world data and phenomena, and/or role-playing and case studies, to enhance the dynamics of participation in a parallel environment; and
- Other visual presentation formats (e.g., PowerPoint, Keynote Lessons, or online modules/sites)—ensuring that slides/pages are cleanly presented one at a time with iconic imagery or unique media and with limited crowding of images, text, or listed bullets.

Online Collaborative Learning

4. Incorporate discussion, group work, and sharing, using both synchronous and asynchronous communication tools.
5. Encourage learners in an online course to reflect on and gain new experiences in their online and offline communities and utilize those experiences in the course.

Student Engagement and Assessment

6. Communicate actively with students online, offering quick and regular feedback (e.g., using feedback tools included with word processing software and posting graded assignments back to the learning management system), responding promptly to student queries, posting regular announcements, and providing motivational support. (A powerful feature of technology-based assessment and intelligent tutoring systems is the ability to generate automated and immediate feedback.)

Technical and Course Delivery Support

7. Ensure that students have access to training (face-to-face and/or online) and support, so that they can use instructional tools effectively.
8. Build in contingency plans for technical difficulties.

APPENDIX F

REPORT ON THE ENHANCED SERVICE MODEL FOR INSTRUCTIONAL TECHNOLOGY SUPPORT (SPRING 2014)

REPORT AND RECOMMENDATIONS

Provost David McLaughlin has prioritized NYU's efforts to use technology effectively to support its academic mission and further its commitment to innovation in teaching and learning, pedagogical practices, and research.

During the course of the 2013-2014 academic year, NYU advanced the Provost's goals around technology-enhanced education through the following strategic initiatives:

- Formation of a Faculty Committee on the Future of Technology-Enhanced Education at NYU as a part of the existing Teaching Technology Committee and IT Governance Structure
- Creation of a central team of instructional technologists to work with faculty on enhancing their teaching with technology. This central team of instructional technologists, established in 2013, continued working with individual faculty on courses, extending those efforts to working with Deans on multicourse curricular initiatives, programs, and certificates.
- Allocation of additional pedagogical and instructional support positions within the schools to compliment the central team's efforts and propagate support for instructional needs at the schools
- Development of a new unit, Enterprise Initiatives, that will focus on creating content and materials to support online learning opportunities and engagement with external constituents
- Establishment of a working group to focus on enhancing instructional technology services for faculty

OVERVIEW

In response to the initiatives listed above and with the guidance of the Faculty Committee on the Future of Technology-Enhanced Education at NYU (FTEE), the Teaching Technology Committee, and executive sponsors Matthew Santirocco, Carol Mandel, Marilyn McMillan, and Tom Delaney, the working group was created to focus on instructional technology support services for faculty. This report describes the group's work and findings over the last year to enhance these services.

Beginning in spring 2013 and facilitated by Ben Maddox, the working group has been charged with the development of an Enhanced Service Model for Instructional Technology Support (ESMITS), to build on the successful collaborations already in place across teams. It includes staff members from the following divisions: Libraries, Global Technology Services, Information Technology Services, Office of Academic Assessment, Center for the Advancement of Teaching.

The service model aims to increase faculty awareness and experience with instructional technology, while leveraging the talent, skills, and existing collaboration of support specialists from across the University. It also aims to establish a uniform platform for capturing essential information regarding support and services to identify emerging trends and unmet needs. Since the launch of the service model last fall, we have learned a great deal through our collaborations with instructors across the schools, portals, and global sites, and also from one another as a virtual team.

KEY GOALS

The following goals have guided the work of the working group over the course of the year:

1. Help faculty more easily and efficiently find our services throughout all NYU campuses, schools, and sites.
2. Increase visibility of and access to new and existing services.
3. Capture metrics to identify emerging trends and met/unmet needs for tools, skills, training, and collaboration.
4. Leverage collective strengths and skills across teams.

DATA-DRIVEN FINDINGS

A number of key findings emerged through our work together and by gathering and sharing metrics across the teams—a challenging but beneficial task. The collection of metrics for ITS/GTS and Library teams is a long-standing part of daily operations, with approaches varying from team to team about what to capture and under which circumstances. We took an iterative approach to this, trying different methods to help identify needs and capacity, without disrupting or distracting from the service experience and efficacy of working with instructors to respond to their requests or resolve their issues. We are considering the integrated look at these metrics as benchmarks from the service model, though some of the groups do have year-over-year statistics, which allow us to look back as well as forward for trends.

What we found was an astounding amount of work going on across the teams, with over 7,000 requests (from August through early March), varying from Learning Spaces and Classroom Support (more than 2,600); Digital Studio Uses and Interactions (more than 1,800); Tool & Services, primarily NYU Classes and Google Apps (more than 2,400); and thousands more from the broader community. Noting these high-numbers midservice model, we increased capacity through cross-training efforts and embedding two IT Help Desk team members which enabled increasing numbers (more than 34 percent) of the NYU Classes requests to be resolved by the IT Help Desk, in effect extending the business day to the longer hours of availability of the Help Desk team. Also noted were unmet needs in the area of creating web materials and training materials, which prompted our ongoing adoption and expansion of Lynda.com and Web Publishing services. A new area of emphasis and growing interest is consultations. Our teams conducted over 500 in-person consultations and hundreds of additional orientations of Classrooms, the Blended Learning Studio where faculty work with instructional designers to create video content for their courses. More than 30 faculty members have created video modules for their courses during the Spring 2014 semester.

Over 90 percent of the requests came in either by phone or email (58 percent and 34 percent, respectively). In our follow-up survey with faculty (of the 1,100 faculty who were invited to complete the survey, just under 200 did so), the highest satisfaction ratings were for staff professionalism (71 percent or above satisfied), responsiveness (66 percent or above), and tools and services (48 percent or above). Of the 200, 34 (17 percent) rated themselves either very dissatisfied or minimally satisfied. Some of the issues reported were technical in nature, while others suggested the need for improved training, communications, and awareness efforts. A phase two goal is to look more closely at feedback on specific tools and service practices to better understand if and/or how they can better meet the need of our faculty. We are following up with individuals who had concerns, posed questions to us in the survey, or asked for additional support.

Comparatives would be ideal and will be forthcoming in AY15, after this, our inaugural year. While year-over-year integrated data will be the best determinate, we've already gained important insights. We noticed that requests that we had categorized as incidents, like correcting access to a system or classroom repair, followed a predictable pattern of peak times at the beginning of the fall and spring semesters (August through October and January through February). We also noticed, however, that faculty requests for information and consultations increased steadily over the course of the service model month-by-month throughout the fall and spring, with one spike in requests in February for consultations around course design. Finally, we also saw ourselves improve as a "virtual team"—by the second training workshop that we offered for the teams involved in providing support, we

saw dramatic improvements in satisfaction: from approximately 31 percent in the first survey (October) to more than 80 percent either somewhat or very satisfied after the second internal training workshop (January).

RECOMMENDATIONS

With almost two semesters of experience and data from the ESMITS effort, we have the opportunity not only to reflect upon the day-to-day needs for enhancing support for technology-enhanced education but also to look ahead to the broader potential opportunity for the University. We propose several recommendations for evolving and achieving our shared goals of instructional technology support at NYU.

1. **Extend the successful work of the service model** and affinity group by establishing an ongoing structure for instructional technology coordination with representation from the schools, global sites, and central units. The structure should be established by examining its best link to the overall emerging teaching and learning governance structure, pending report by FTEE, as well as school-based and operational advisory groups. This coordination effort is significant, will require dedicated resources, and is critical for continuing to establish shared knowledge areas, skill sets, and common practices aligned with University standards and priorities.
2. Work with schools to **align more proprietary classrooms and learning spaces** with general purpose classroom standards that are compatible with the global network university.
3. **Enhance the capacity for the Digital Studio and other centrally located facilities to be more visible** as service points for instructional technology at NYU, reinforcing collaboration among all the groups, including the Center for the Advancement of Teaching and new school-based resources.
4. **Strengthen cross-functional knowledge and competencies through training and certification programs** with general purpose classrooms that are compatible with the global network to improve faculty support, service delivery, and mentoring and professional development.
5. Support workshops, training, and other forms of outreach to create **opportunities for faculty within and across disciplines** to share challenges and successes in the areas of instructional innovation, assessment, and experimentation.

OPERATIONALIZING RECOMMENDATIONS

Reflecting on the four goals established for ESMITS, we identified some operational impacts and next steps resulting from the recommendations above. The working group offers the following operational impacts in terms of skills, staffing, space, structure, and strategy.

- **Skills: Provide funding for the development of cross-functional training programs.** Based on the feedback we are receiving, support for the ongoing development of cross-functional training and core competencies across school and central units will help us increase our capacity to respond to increasing numbers and diversity of requests and promote mentoring and professional development opportunities across teams. Metrics inform the training in areas where subject matter expertise or generalist skills are needed to respond to service gaps or growth (such as video production, data analysis, and web development skills).
- **Staffing: Establish a permanent role to continue the working group's efforts and support the ongoing coordination and communication across central, schools, and sites.** Provide for a role/assignment to ensure the ongoing coordination of enhanced support for faculty using technology in their teaching through collaborative efforts across schools and units, including the creation of specific positions to facilitate this work. This includes the need to facilitate ongoing communication and coordination across groups, schools, and global sites, while helping to increase awareness of academic technology skills beneficial to have at the IT Service Desk. In addition, this individual would help identify and share evolving industry and University best practices for instructional technology support services.
- **Space:** Continue to assess and evaluate centrally located facilities and resources to respond to emerging needs and improvement in services in support of technology-enhanced education. Ensure that instructional support spaces and collaborative spaces are equipped with appropriate furniture, staffing, and tools to support creativity and collaboration.
- **Structure & Strategy:** NYU is a globally distributed and diversified organization. With all schools and sites involved in supporting faculty on different levels, the ongoing alignment between and across our teams requires the continued commitment, engagement, and guidance of our leadership and community members.

APPENDIX G

TENTATIVE PROGRAM FOR THE FALL 2014 CONFERENCE “BEYOND THE YEAR OF THE MOOC: BEGINNING A CONVERSATION ABOUT TECHNOLOGY-ENHANCED EDUCATION AT NYU”

Friday, September 12, 8:30 a.m.–3:00 p.m, Eisner and Lubin Auditorium (4th Floor, Kimmel Center). In adjacent rooms, concurrent demonstrations will take place throughout the day to showcase exemplary projects in technology-enhanced education.

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| 8:30 a.m. | Breakfast buffet |
| 9:00 a.m. | Welcome remarks David McLaughlin (Provost, New York University; Professor of Mathematics and Neural Science) |
| 9:10 a.m. | Symposium: “Online Is Never as Good as the Face-to-Face Classroom Experience, Right?” <ul style="list-style-type: none">• W. Russell Neuman (Professor of Media Technology, Steinhardt School of Culture, Education, and Human Development), <i>Convener</i>• Joshua Blank (Professor of Tax Practice and Faculty Director of the Graduate Tax Program, School of Law)• Shankar Prasad (Clinical Professor, Robert F. Wagner Graduate School of Public Service)• Gregory Wolniak (Clinical Associate Professor of Higher Education, Steinhardt School of Culture, Communication, and Human Development; Director, Center for Research on Higher Education Outcomes) |
| 10:00 a.m. | Break |
| 10:10 a.m. | Symposium: “Global Education Plus Technology = ?” <ul style="list-style-type: none">• Matthew S. Santirocco (Senior Vice Provost; Professor of Classics, NYU Faculty of Arts and Science), <i>Convener</i>• Kwame Anthony Appiah (Professor of Philosophy, Faculty of Arts and Science; Professor of Law, School of Law)• Pankaj Ghemawat (Global Professor of Management and Strategy, Leonard N. Stern School of Business) |

FACULTY COMMITTEE ON THE FUTURE OF
TECHNOLOGY-ENHANCED EDUCATION AT NYU

- 11:00 a.m. Break
- 11:10 a.m. Symposium: “This is Your Brain on Education: New Findings from Neuroscience”
- Peter Schilling (Associate Vice President in Global Technology Services for Learning and Innovation), *Convener*
 - Clancy Blair (Professor of Cognitive Psychology, Steinhardt School of Culture, Education, and Human Development; Principal Investigator, NYU Neuroscience and Education Lab)
 - Thomas J. Carew (Anne and Joel Ehrenkranz Dean, Faculty of Arts and Science; Professor of Neural Science)
- 12:00 p.m. Lunch
- 12:30 p.m. Keynote address
Anant Agarwal (Chief Executive Officer, edX; Professor of Electrical Engineering and Computer Science, Massachusetts Institute of Technology)
- 1:30 p.m. Symposium: “Technology and the Economic Challenges to Higher Education”
- Richard Matasar, (Vice President for University Enterprise Initiatives; Professor of Management, School of Continuing and Professional Studies), *Convener*
 - Aswath Damodaran (Kerschner Family Chair in Finance Education and Professor of Finance, Leonard N. Stern School of Business)
 - Beth Noveck (Jacob K. Javits Visiting Professor, Robert F. Wagner Graduate School of Public Service)