REPORT OF THE COMMITTEE ON PREPARATION FOR ONLINE TEACHING

June 15, 2020

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INTRODUCTION

The Committee on Preparation for Online Teaching (C-POT) was charged with making recommendations in the event that most or all instruction would remain online for the fall semester, and possibly the spring semester as well. Committee deliberations were based on the expertise that various committee members had in moving the university to online education in the Spring 2020 semester, as well as data collected to better understand the experiences, challenges and innovations of that transition.

The charge included a number of specific questions, which the committee expanded to encompass in a more comprehensive way several key areas of inquiry:

1. Substantive Curriculum and Modes of Delivery
- In light of the Spring 2020 experience, should we attempt to offer the regular fall curriculum or should departments and colleges rethink their general approach to the substantive curriculum (e.g., more limited course offerings, scope of coverage, altered major requirements, etc.) in order to best ensure high quality online instruction?
- Are there recommended changes in the modes of delivery (e.g., large classes, labs and studies) or the scheduling of instruction to ensure high quality instruction?
- Would we make spring and summer offerings more robust for 2021 and beyond should online instruction continue beyond the fall?

- Should online instruction be sequenced or staged, e.g., only upper-class or only freshman fall instruction?
- How would we make such decisions?
- How do we need to revise or strengthen our grading and academic integrity policies?
- Should we continue with or change the overall approach taken in Spring 2020?

2. Support for Effective Online Delivery
- Assuming all or many Fall 2020 courses will need to be taught remotely (with or without an in-person component) are any additional faculty training or support mechanisms needed, and where would faculty be directed to receive such training and support?
- What technology issues, including student and faculty access to technology, infrastructure and licensing needs, etc. should be addressed to best support remote instruction?
- How should ADA issues be addressed in a consistent manner to ensure functional accessibility?

3. Student Experience
- How can we best define co-curricular programming at Cornell and understand its role in creating the Cornell experience, maintaining equity, and a sense of belonging to the community—in the classroom and at Cornell?
- How can instructional faculty in collaboration with staff build co-curricular programming into online/remote courses and the substantive curriculum?

4. International Students and Instruction
- How can online instruction best be structured to support effective remote or online education for international students?

Subcommittees were formed to consider these areas and make specific recommendations. Those subcommittee reports are reprinted below the Executive Summary of this report. For sake of completeness, the specific questions contained in the original charge, as well as the committee's views on those questions, are set out in Appendix A.

EXECUTIVE SUMMARY

At the outset, it is important to recognize that the committee's recommendations build upon the already extensive efforts made by the university and its colleges, schools, departments and faculty to switch to online instruction midway through the Spring 2020 semester. Since that time, the Center for Teaching Innovation (CTI), Cornell Information Technology (CIT), eCornell and the University Library have continued their efforts to enhance and refine online instruction as new resources become available and our collective understanding of effective online teaching deepens. The committee's recommendations do not suggest any significant departures from the online strategies, tools and approaches already in place, but instead focus on specific aspects of online instruction where additional enhancements may be warranted. Extracted below are the key recommendations of the subcommittees.

1. **Key Recommendations: Subcommittee on Substantive Curriculum and Modes of Delivery**

   The subcommittee declined to make any generic recommendations regarding the narrowing, sequencing or redirection of course curricula. Curricular planning involves a wide array of discipline specific variables and is therefore in substantial part the province of departmental faculty. Those faculty are already intensely engaged in deciding what courses can and should be offered depending on the general direction taken by the university, the need to provide progression through departmental majors and the available instructional resources. Moreover, given the possibility that significant online instruction may need to continue through the spring semester, the committee decided against recommending that specific kinds of instruction – e.g., lab course, studio and performance courses – be generally delayed to the spring semester. In short, the committee believes the departments, in consultation with their school or college dean, are best situated to make appropriate curricular adjustments. Below are the key specific recommendations of the subcommittee.

Curriculum Scheduling: Departments and majors should be cautioned against moving courses between spring and fall based on expectation of relaxed social distancing requirements in the spring. As the spring semester may be equally restrictive, shifting a large number of challenging courses to the spring (especially labs) may result in additional challenges and stress for students and instructional staff.

Course Structure, Format and Modality: Faculty and instructors of record should be given the flexibility to design their course and choose the online teaching modality that they determine will optimize student learning, with departmental approval. All courses must, however, support remote, non-synchronous, participation including video capture of course content. General guidelines and expected standards of quality should be clearly communicated to faculty and instructors of record as early as possible in order to allow for successful adoption. Expected standards of quality will also have to be practically realizable within the preparation timeframe and the availability of required resources and facilities.

In-person scheduling priority: If some courses are held in-person in Fall 2020, scheduling priority should be given for the limited number of classes where in-person is the only viable modality. Faculty and departments should base criteria for prioritizing in-person classes both on the content of the individual course and on its curricular role (crucial gateway course, etc.) These courses must still have structures in place to address students in quarantine.

Avoiding unintentional student overload: A common concern raised by students in surveys was the increase in workload during the Spring 2020 term as faculty transitioned to remote delivery. Instructors should review course expectations and ensure they are no more time-consuming than the in-person equivalent course. Instructional staff should also be strongly encouraged to solicit feedback early in the semester to monitor actual workload and adjust expectations accordingly.

Grading policies for Fall 2021: The committee believes that any university-level decision on a grading policy should be definitive (to provide clarity to students and faculty) with any change only occurring under the most extreme of situations. The majority view of the committee is that grading policies should return to the conventional graded format with a suggestion that faculty consider the student option (letter or S/U) if appropriate. The majority does not believe either mandatory S/U or universal

student option (student choice of S/U or graded in all courses) would be appropriate as we move forward.

However, it is important to note that student members of the committee disagreed with this recommendation and argued instead that adopting a universal student grading option would help address the underlying inequities in learning during the pandemic including time zone issues, unequal home environments, and illness/bereavement, while allowing students to choose the grading option that works best for their needs and situation.

Considerations around the academic calendar: In discussions of the fall academic calendar options, the impact of schedules on academic integrity should be carefully weighed. The committee strongly believes that calendar options that include in-person exam periods (either at the end of the semester or after a significant portion of the semester) would be the most effective means to minimize academic integrity issues around exam-type assessments**.** Addressing academic integrity must, however, be balanced against other challenges raised by in-person exams including TA and student safety, psychological stress of high stakes assessments, and logistical challenges of administering both in-person and remote exams for a single course.

Restructuring lab/studio courses: In any of the models for fall instruction, lab and studio instructors should explore options to adjust learning objectives (without significant negative impacts) to enable remote format instruction; this is necessary in the event that courses must be offered remotely and to manage anticipated student absences for quarantine. For example, lab courses using simulators, remote control, or home kits for the hands-on component might focus more strongly on objectives involving data analysis, presentation skills, and teamwork. Studio and performance courses shifting to visiting artist performances/interviews and individual work might highlight objectives involving pedagogy, history, and theory.

Potential resources to assist in the online transition: The university should consider employing graduate and professional students who have experience with deploying advanced technology in their online teaching practice as additional technical support for course preparation this summer through CTI (in addition to considering employing graduate students as course preparation assistants for individual courses over the summer and as additional TAs during the fall).

Spring/Summer 2021 advice: Given that there is no firm evidence that this pandemic will not extend into the spring semester, instructional staff should be encouraged to develop contingency plans for offering spring and summer classes online or remotely. In addition, many of the elements of online formats, including lecture content available for off-line viewing, would likely be valuable to students long-term with a return to full (normal) residential model.

Supporting students in fully remote model: If the fall structure mandates a large fraction of students in remote (home) online learning situations, resources should be prioritized to ensure that students are not disadvantaged by this model due to technological limitations or learning environments. Flexibility with respect to course requirements, timeframes, and metrics will likely be necessary to achieve this goal. Ensuring that faculty understand the challenges will also be a necessary communication. The university must also provide sufficient financial resources towards securing technology solutions for these students.

Resource challenges: The committee identified numerous specific needs as well as opportunities to enhance the effectiveness and robustness of online content delivery. Many of these recommendations require additional resources. We recommend the formation of a new

implementation committee, including representatives from finance, to look at key resource challenges.

- Identifying and funding sufficient TA resources to manage increased numbers of sections in a hybrid model
- Identifying potential support (e.g. for graduate students) to assist faculty with course development over the summer
- Managing the scalability of training and support resource within CTI and CIT – both of which are heavily leveraged already to support the transition

Managing expected absences: The university should formalize guidance to address potential instructional staff absences for fall courses. The plan would include a requirement for all courses to have an explicit plan for instructor and/or staff absence for a minimum of the mandatory two-week quarantine period. Faculty should be encouraged to consider longer scenarios of staff absence due to coronavirus-related complication and other conditions.

Addressing Academic Integrity in the online environment: The committee recommends a three-pronged effort to manage academic integrity in an online environment: (i) education and discussion, (ii) reduction of motivation and opportunity, and (iii) coordination of efforts to address infractions at the university level. Details of these recommendations are more fully enumerated in the full report. Key elements include:

Education and discussion: Academic integrity should be comprehensively and intentionally discussed during the early weeks of an online semester and expectations clearly defined for students and faculty in course syllabi.

Reduction of motivation and opportunity: Reduced reliance on high-stakes exams and structuring of assessments can significantly decrease potential for AI violations. However, the committee is keenly aware that many options are applicable to only a subset of courses and that many options entail significant faculty/staff effort. Despite the challenges to maintaining academic integrity in online exam formats, we do not believe that online proctoring is a viable solution.

Assist efforts to address infractions at the university level: The committee recommends the creation of a central office or function (likely under the Dean of the Faculty's office) that would be able to assist unit AIHBs in addressing time-intensive investigations and large-scale violations of Academic Integrity, including coordinating discussions with online sites such as CourseHero and Chegg.

2. Key Recommendations: Subcommittee on Effective Online Delivery

Video teleconferencing platform: Continue using Zoom as Cornell's video teleconferencing platform for the fall semester and beyond.

Training and resources: several subcommittees made recommendations around enhanced training and resources. These span the various key challenges and are included here for completeness.

- Develop and broadly disseminate (through CTI or the Dean of Faculty office) operational resources that provide concrete guidance to faculty on course redesign and implementation. These should go beyond "best practice" concepts to specific, pragmatic examples for rapid adoption by faculty (e.g. full course Canvas sites that are exemplars of target quality or in ADA compliance in different disciplines, and specific course examples of effective online assessments in a diverse array of disciplines).

- In collaboration with the Skorton Center, clear guidelines should be established for how faculty members should supervise teaching assistants during the pandemic, including the setting of reasonable expectations, both emailed to all faculty and supported through CTI or Skorton Center workshops. The Skorton Center has already hosted virtual faculty workshops on supportive mentorship of graduate students during the pandemic that could potentially be expanded to a wider faculty audience.
- CAPS should create a handout of resources on how to recognize distress in students virtually and where to send students for help in such situations. CTI and colleges should publicize and disseminate the handout to instructors.
- SCL/Dean of Students 'Virtual Engagement' web group should work with CTI to create a training tool and handout for staff to take social, performative and wellness related co-curricular programming online, including building in components related to faculty-staff collaboration to take programming into classrooms through one-time activities focused on a class period or assignment or more sustained longer collaborations.
- Additional focused training on small group engagement and facilitation within Zoom should be developed and disseminated by CTI. For courses offered in the online format only (large lectures, etc.), this training should be strongly recommended. Instructional staff teaching in any modality are urged to utilize resources such as webinars. Excellent guidance for international events and good virtual publications have been developed by Global Cornell and should be disseminated more widely.
- Continue to support and expand the training efforts within CTI. Include new training specifically targeting support instructional staff in courses including TAs. Once the decision about the fall format has been made, instructors should be pointed towards CTI training resources specific for fall instruction, and encouraged to participate
- Some departments have been hosting high-quality workshops for their faculty members and TAs. CTI should consider requesting permission to record highly effective departmental-level workshops and making those videos available to instructors in other departments through the CTI website. CTI should also continue to strengthen communities of online-teaching innovators by creating a separate space for community sharing of techniques and best practices; this will encourage peer-mentoring and local support.
- CTI should continue to identify and/or develop resources to help faculty to move away from exams to alternate assessments including projects, presentations, design efforts, etc. in courses where such assessments are appropriate. Wherever possible, these resources should include concrete exemplars from a range of disciplines alongside more general guidelines.

Accessibility: New materials developed for online courses should be designed to be accessible to individuals with vision and hearing disabilities so that Student and Disability Services can assist with accommodation of other individual disabilities upon request as has been the norm with in-person teaching. New software tools are available to make the process easier. Continue and accelerate CTI, CIT and library efforts to assist with training and resources related to making course materials accessible. Publicize the emerging trainings and resources found on the CTI and CIT web pages.
- Continue training of staff volunteers to use new accessibility tools like Ally.
- Recommend that departments identify and train additional staff to work with faculty to remediate materials for fall courses; continue the effort for spring courses and ultimately all courses for the future.

Home office equipment and access:

- Facilitate ways for instructors (including TAs) to retrieve equipment from campus in order to teach from home if necessary.
- Address computing needs in financial aid packages (including need for data plans or wifi hotspots) and increase the Access Fund for undergraduate, graduate and professional students.
- Accelerate central procurement of additional laptops, tablets, mobile hotspots, tablets with styluses etc., that can be given out as part of the lending library. This has to be done as soon as possible, to allow for delays in the supply chain. Also identify ways for departments to surface technology needs, including for graduate students, and join larger central procurement efforts.
- Continue to facilitate remote access to software such as Adobe Suite (e.g. through AppStream).
- Continue to identify and address weak or insufficient wifi coverage in dorm rooms or other common workspaces on campus.
- Encourage colleges to stand up a number of smaller, but still well-equipped and moderate quality, recording studios. Assemble a list of specific technical requirements and possibly coordinate a purchase order.

3. Key Recommendations: Subcommittee on Student Experience

For the purposes of this subcommittee, we define co-curricular as programming focused on four areas: developmental which includes career development, wellness, social engagement, and performance/creative opportunities. Equally, we see co-curricular programming as experiential learning that complements course curricula.

Under the strain and pressure of the pandemic, we strongly encourage the university to not lose sight of the critical role of co-curricular experience in student success. From hack-a-thons to mentoring programs in the LGBT Resource Center, the experiences that Cornell students have outside of class are essential to their cognitive, emotional, and physical wellness. Any transition to a largely virtual experience for our students must include integrated co-curricular components, or we will impoverish the student experience and fail in our core mission as a world-class university.

Strongly encourage all online/remote courses to include an experiential component to build community and belonging in the classroom. These components can draw from the four types of co-curricular programming described on page 35 and should aim to increase student engagement, student success, and student satisfaction. A component can be a range of activities from something as specific as how an assignment is prepared or how a breakout room discussion is facilitated to something as broad as a designed collaboration with a unit that offers co-curricular activities.

Make resources available to instructional faculty to assist and enhance inclusion of experiential components in academic course work:
- CTI to build an instructional video to help faculty/staff understand the value of the co-curricular/experiential component and offer design principles for co-curricular integration into the substantive curriculum. Integration to also be explicitly noted and encouraged in *all* webinars and training sessions offered to faculty and instructional staff.
- SCL/Dean of Students Office to revise and enhance the 'Virtual Engagement' site and make it a key nodal location that highlights a range of co-curricular activities that have been taken virtual.

- Work with key units/websites (a full list is available on page 33) that focus on experiential and virtual engagements to create links to each other, building an ecosystem of sites that point instructional faculty towards a variety of co-curricular programming.

Encourage relevant co-curricular units to work with faculty and instructional staff to develop collaborations This is a longer-term effort but a small start now may yield large dividends later and the few experiences we see should be amplified through recognition).

4. Key Recommendations: Subcommittee on International Students and Instruction

Provide fall-semester residential options abroad for international students who are not able to return to Ithaca this fall. These options would be available in international locations where Cornell has significant numbers of students, good university partners, and student life can be provided in a context that matches the Cornell Ithaca campus for health and safety. While this 'study away' option cannot replace or replicate the on-campus experience at Cornell, students in these locations would have the opportunity to be with Cornell peers and have access to university facilities while taking all or most of their classes online from Ithaca.

Ensure that all instruction is accessible to international students who may be situated across a variety of time zones and for whom English may be a second or third language. For time zones: check in early with all students to find out what time zone they are in and incorporate that information into the assignment of: study groups, exam times, office hours and discussion sections.

Assess privacy concerns early on for international students and explore the best platform and modes of delivery for lectures and small group discussions. In most cases, Zoom works well for meetings but given the variety of technology challenges delivering international content, especially those which censor content, CIT will continuously monitor and investigate potential alternative solutions. CTI will develop teaching related resources and share details on the CTI webpage when alternatives become available via the CIT vetting process.

Provide access to international co-curricular and curricular programming and content as most people will not be traveling frequently but will be able to access international and area studies' content from faculty, staff and students in Ithaca and abroad.

FULL SUBCOMMITTEE REPORTS

Report of the Subcommittee on Substantive Curriculum and Modes of Delivery

Charge 1: In light of the Spring 2020 experience, should we attempt to offer the regular fall curriculum or should departments and colleges rethink their general approach to the substantive curriculum, (e.g. more limited course offerings, scope of coverage, altered major requirements, etc.) in order to best ensure high quality online instruction?

In considering this question, the committee was constrained by the large range of options that remain possible with respect to the fall semester. Decisions with respect to reducing curriculum – either required or elective courses – would depend critically on the various modalities. In general, the committee recognizes the large challenges that would be posed in many departments by changes in the number and nature of course offerings and the impact on graduation rates and timing (especially in majors with constrained and proscriptive curricula). Any such decisions would ultimately have to be determined at the department level governed by resources within the college and university.

One option that has been widely considered we believe warrants a negative recommendation: broad rescheduling or restructuring of curricula to shift courses more critically reliant on in-person instructors to the spring and favoring courses that would be more amenable to online instruction to the fall.

Modifications to curriculum course offerings to support a smaller number of high-quality online courses may be appropriate for some programs, especially those with a broad range of elective courses.

In the event of a fully online offering for the fall (no residential component), there will be critical issues for courses where the in-person component is absolutely critical for the learning outcomes (performance-based courses, some lab courses requiring unique facilities). For these courses, programs will need to first consider if the learning objectives can be modified without impacting the overall program or if they can be achieved in other ways consistent with remote delivery. In the absence of any such mitigations, it will be necessary to defer the courses until in-person instruction resumes. Programs should carefully consider the impact of such deferrals on student graduation and curriculum restrictions (pre-requisite courses limiting student options).

Recommendation: Departments and majors should be cautioned against moving courses between spring and fall based on expectation of relaxed social distancing requirements in the spring. As the spring semester may be equally restrictive, shifting a large number of challenging courses to the spring (especially labs) may result in additional challenges and stress for students and instructional staff.

Charge 2: Are there recommended changes in the modes of delivery (e.g., large classes, labs and studios) or the scheduling of instruction to ensure high-quality instruction?

The committee recognizes that there are two distinct course modalities that must be addressed separately: (i) courses that are primarily lecture and/or discussion and (ii) lab/studio courses that require access to specific equipment and/or spaces for optimal instruction and learning. Within each of these groups, there are additional divisions that must be equally considered.

Lecture/Discussion Courses:

Pedagogical data generally indicates that asynchronous delivery is significantly more effective than synchronous delivery for lecture components of online courses, a conclusion that spans course sizes. However, this generalization must be recognized as applying "on average" and individual courses are more nuanced in the most effective strategies. While there is additional time for planning and execution for fall online courses, development of high-quality "flipped" classes (asynchronous lectures and optional collaborative sessions) would likely require time, resources, and faculty interest that cannot be assured. In cases of high instructor interest and sufficient resources, high-quality "flipped" classes are a desirable way to maximize the utility of in-class time and the benefits of asynchronous lectures.

Student and instructional staff surveys also indicate a range of preferences and broad levels of satisfaction with any number of instructional modalities:
- Asynchronous lectures with interactive Zoom sessions (spanning both high and low total contact time).
- Synchronous lectures (with asynchronous option) that maintained connections between the instructors and class helped some students feel more connected to coursework and classmates.
- Hybrid formats with both asynchronous and synchronous delivery, and a variety of interactive strategies.

The ideal format for any given course is likely a complex interplay between the course itself, the instructor style and comfort in an online setting, and the individual student cohorts.

Across all modalities, however, students universally expressed value and appreciation for the ability to view lecture materials asynchronously – either as a substitute for lectures or for review of the material. This was particularly important for international students. Given the need to address students who are remote in any of the fall options (including being quarantined for Covid-19), all courses need to have content video recorded for asynchronous review. Less clear is whether all content, including discussions, needs to be recorded in the online environment.

The instructor workload, in preparing and delivering a course in a new online modality, cannot not be prohibitive/overwhelming. This, in itself, would be counterproductive to the goal of providing quality instruction. Clear guidance and support to instructors on what the expectations are for new modalities is important.

Recommendation 1: Faculty and instructors of record should be given the flexibility to design their course and choose the online teaching modality as they determine will optimize student learning, with departmental approval. All courses must, however, support remote, non-synchronous, participation including video capture of course content. General guidelines and expected standards of quality should be clearly communicated to faculty as early as possible in order to allow for successful adoption.

Expected standards of quality will also have to be practically realizable within the preparation timeframe and the availability of required resources and facilities.

Recommendation 2: Develop and broadly disseminate (through CTI or the Dean of Faculty office) operational resources that provide concrete guidance to faculty on course redesign and implementation. These should go beyond "best practice" concepts to specific, pragmatic examples for rapid adoption by faculty (e.g. full course Canvas sites that are exemplars of target quality or in ADA compliance in different disciplines, and specific course examples of effective online assessments in a diverse array of disciplines).

A key challenge noted by numerous surveys and discussions related to workload expectations and challenges. Students expressed that they felt overloaded (exhaustion) by instructors during the spring semester. Some of this overload may be related to other disruptive events; but it is likely also a result of changing assignments and assessments by instructional staff, and the loss of informal support mechanisms that exist with in-person instruction (e.g. upper-class students within their social network, tutoring). Instructors should carefully review the course content and ensure that the workload (especially in classes that combine synchronous and asynchronous methods) does not exceed that of a normal in-person modality. Instructors should also clearly articulate how online expectations are consistent with the more familiar in-person analogues. (Note: This also drives some of the academic integrity issues (see below) insofar as self-reported violators cited perceived increased workload as a motivating factor.)

Recommendation 3: A common concern raised by students in surveys was the increase in workload after April 6 as faculty transitioned to remote delivery. Instructors should review course expectations and ensure they are no more time-consuming than the in-person equivalent course. Instructional staff should also be strongly encouraged to solicit feedback early in the semester to monitor actual workload and adjust expectations accordingly.

Teaching assistants (TAs) also reported feeling burdened by unrealistic workloads during the Spring 2020 semester. According to the Graduate and Professional Student Reopening Survey, before the pandemic 12.3% of respondents reported working 5 or more hours more than their assigned hours on average, and after the pandemic that number rose to 30%. Some of the reasons for this extra time spent by TAs included an increase in communication with students and other instructors, an increase in administrative work, and extra time spent making online content for courses.

Recommendation 4: In collaboration with the Skorton Center, clear guidelines should be established for how faculty members should supervise teaching assistants during the pandemic, including the setting of reasonable expectations, both emailed to all faculty and supported through CTI or Skorton Center workshops. The Skorton Center has already hosted virtual faculty workshops on supportive mentorship of graduate students during the pandemic that could potentially be expanded to a wider faculty audience.

Many graduate TAs also reported that increased emotional work was put on them during the Spring 2020 semester in the form of supporting students in difficult situations. The burden of addressing students' mental health challenges should not fall on faculty and TAs, who have neither the training nor the time to properly address students' mental health needs.

Recommendation 5: CAPS should create a handout of resources on how to recognize distress in students virtually and where to send students for help in such situations. CTI and colleges should publicize and disseminate the handout to instructors.

Zoom was a powerful tool for delivering content and for facilitating discussions. In general, the quality of interactions decreases with the size of the groups; small group discussions via Zoom were commonly reported as successful (though not universally) while large group settings were commonly identified as ineffective. Use of "break-out" rooms were similarly identified in many cases as a viable strategy to maintain connections with the class. Additional training in maintaining engagement with students will be critical.

Large Zoom sessions were identified as particularly ineffective. In large classes (and probably all courses), Zoom interactions should be structured to provide for small cohorts. This is also particularly true for interactive TA sessions or discussion groups.

Small group sessions also provide community-building opportunities albeit with challenges arising from time zone differences. While a key opportunity for TAs, there are issues with, for example, international TAs providing live sessions for students in other time zones. Continued training around Zoom capabilities to simulate "consulting hours" is necessary, and an alternative platform to better address multiple students seeking help simultaneously may be appropriate (Zoom was too slow at times).

Recommendation 6: Additional focused training on small group engagement and facilitation within Zoom should be developed and disseminated by CTI. For courses offered in the online format only (large lectures, etc.), this training should be strongly recommended along with direct consultation with CTI or other teaching support staff. Instructional staff teaching in any modality are urged to utilize resources such as webinars.

A highlight of the spring, and noted extensively in student/faculty surveys, was the quality and quantity of support for online instruction through training sessions and "office-hours" offered by CTI and other offices. These will remain a critical element to ensure quality instruction in the fall. Some of the noted comments and needs include:
- Centralized list of resources for instructional staff (e.g. training videos, pedagogical literature, effective small group discussion concepts); much of this already exists.
- Continued development of CTI training materials (webinars, etc.) and CTI Zoom "office hours". These were generally recognized for being more useful than other web resources (esp. videos)
- Technology assistance for remote teaching (microphones, lights, software, etc.)
- Strategies for incorporating existing co-curricular offerings into classes (identity groups, career services options, niche offerings e.g. museums, library, Botanical Gardens)

The focus of training in the spring centered around "lead" instructors in classes (e.g. faculty). Moving to the fall, intentional training of other instructional staff, and particularly TAs, should be a focus. While they share many of the challenges of the lead staff, TAs also have unique challenges in supporting small group discussion, assessments, and online course support.

Recommendation 7: Continue to support and expand the training efforts within CTI. Include new training specifically targeting support instructional staff in courses including TAs.

Recommendation 8: Once the decision about the fall format has been made, instructors should be pointed towards CTI training resources specific for fall instruction and encouraged to participate.

Recommendation 9: Some departments have been hosting high-quality workshops for their faculty members and TAs. CTI should consider requesting permission to record highly effective departmental-level workshops and making those videos available to instructors in other departments through the CTI website. CTI should also attempt to strengthen communities of online-teaching innovators by creating a separate space for community sharing of techniques and best practices; this will encourage peer-mentoring and local support.

While many faculty members, including those who did not teach during Spring 2020, are facing the challenges of preparing for online teaching with limited time and pre-existing summer commitments, many graduate and professional students who have extensive experience with online teaching technologies are unemployed or underemployed for the summer. (Over 80 graduate and professional students said that delayed decision making about their on-campus summer job prevented them from finding other work this summer, and over 100 PhD students are not fully funded this summer.)

Recommendation 10: The university should consider employing graduate and professional students who have experience with deploying advanced technology in their online teaching practice as additional technical support for course preparation this summer through CTI (in addition to considering employing graduate students as course preparation assistants for individual courses over the summer and as additional TAs during the fall).

Lab / Field / Studio / Performance Courses:

Labs, field, performance and studio courses (referred to generically as "labs") present unique challenges in any online environment due to the critical requirements for equipment, space and facilities. Strategies that exist for transitioning lecture/discussion courses do not necessarily translate for any number of reasons, including even options for compressed schedules.

Detailed discussion around this challenge is included in Appendix B.

Addressing courses with strong in-person needs will be challenging and highly dependent on the nature of the material. The guidance in Appendix B provides general principles and strategies that will need to be adapted for the specific circumstances.   There are two specific recommendations that the committee would put forward.

Recommendation 11: In any of the models for fall instruction, lab and studio instructors should explore options to adjust learning objectives (without significant negative impacts) to enable remote format instruction. For example, lab courses using simulators, remote control, or home kits for the hands-on component might focus more strongly on objectives involving data analysis, presentation skills, and teamwork. Studio and performance courses shifting to visiting artist performances/interviews and individual work might highlight objectives involving pedagogy, history, and theory.

For any fall modality that includes an in-person instruction component, there should be priority in scheduling and room allocation for courses where the in-person component is absolutely critical. These include labs where there very limited (or no) alternatives to in-person activities due to the nature of the lab itself or the requisite skills. Examples include:

- Labs dependent on growth cycles that cannot be compressed (e.g. plant growth, animal models, plant identification)
- Hands-on animal labs and anatomy dissections where existing simulation and virtual reality alternatives remain significantly less effective (though long-term, VR/AR are attractive)
- Special concerns for studio/performance courses where zero-latency "communication" is critical
  - Audience proximity with (near) zero-latency audio and high-resolution video, often with specialized studio spaces, specialized instruments, and/or supplies. Internet-based tools have proven extremely poor for music and art (quality / latency)
- Architecture and art studio courses involving physical art materials
- Courses involving specialized equipment located on campus

Requests from programs for priority scheduling should base their cases not only on the content of the individual course (how learning objectives can be met only with in-person activities), but also on its curricular context (crucial gateway course, major requirement that cannot be offered in another semester, etc.).
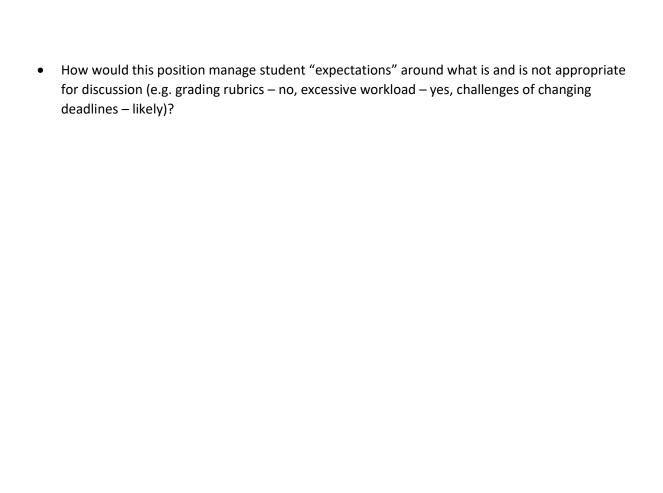
Recommendation 12: If some courses are held in-person in Fall 2020, provide absolute scheduling priority for classes where in-person is the only viable modality. Faculty and departments should base criteria for prioritizing in-person classes both on the content of the individual course and on its curricular role (crucial gateway course, etc.) These courses must still have structures in place to address students in quarantine.

Other suggestions from the committee that did not rise to the level of recommendations:

Communication between students and instructional staff also limits the effectiveness of the online teaching modality. While some instructional staff made extensive uses of multiple communication opportunities, in other cases communication was very limited. Communication preferences also vary between instructional staff and students (Canvas, direct e-mail, Slack, etc.). One potential suggestion would be to strongly encourage instructional staff to use Canvas for formal communication of course requirements and due dates; this would increase the utility and effectiveness of Canvas's calendar.

On the other side, students have limited options for expressing concerns related to their courses. An interesting suggestion was to formalize an ombudsman position for students to relay course concerns (e.g. excessive workload, fairness or equity concerns). However, there are several open questions including:

- Should the ombudsman be at the department, college or university level?
- Would staff, faculty, graduate students, or undergraduates be appropriate given the sensitive nature of discussions but equally the need to ensure students are comfortable bringing forward concerns?

- How would this position manage student "expectations" around what is and is not appropriate for discussion (e.g. grading rubrics – no, excessive workload – yes, challenges of changing deadlines – likely)?

Charge 3: Would we make spring and summer offerings more robust for 2021 and beyond should online instruction continue beyond the fall?

The committee struggled with the meaning of "more robust" within this charge. With respect to coordination of curriculum across semesters (e.g. shifting courses between fall and spring), the issues of robustness would depend critically on the structure of the fall calendar. Consequently, it is difficult to make any recommendations until there is clarity on the modality and format of the fall semester.

Two suggestions were identified with potential both as an opportunity in the current crisis and as a long-term potential for curriculum enhancement.

- Provide additional funding / support to innovate in a small number of courses
    - Provide funding for faculty/grad students to create novel online courses that would be available longer term for winter and summer session offerings
    - Modelled after, for example, Buttrick-Crippen program

- Create "Cornell Open Classroom" video feed (playing on our website, YouTube, etc.) featuring short (15-minute max) videos of online teaching materials submitted by faculty.
    - Showcases the broad range of courses at Cornell to combat impressions of online education as a commodity
    - "Free" for faculty who are already producing videos for their online teaching
    - Can repeat videos so no need to generate 24 hours of contact per day
    - Could also feature short videos from lab or fieldwork sites focused on potential undergraduate experiences
    - Could also feature short videos from "co-curricular" groups and international learning hubs
    - Related idea: weekly podcast featuring a faculty member talking about some of the most interesting problems or ideas students could learn about in their courses

Recommendation: Given that there is no firm evidence that this pandemic will not extend into the spring semester, instructional staff should be encouraged to have contingency plans in place for spring and summer offering to include the online option. Many of the elements of online formats, including lecture content available for off-line viewing, would likely be valuable to students long-term with a return to full (normal) residential model.

Charge 4a: Should online instruction be sequenced or staged, e.g., only upper-class or only freshman fall instruction?

Charge 4b: How would we make such decisions?

Recommendation: None. This is an issue that must be addressed by C-TRO, not an issue of online instruction.

Charge 5: Grading and academic integrity policies – should we continue with or change Spring 2020 approach?

Assessment and academic integrity issues were identified as key challenges in the earliest discussions of the transition to remote delivery in the spring. It is critical that this issue be addressed, for the benefit of both students and instructional staff. There exist three distinct questions that need to be addressed:

- Grading policy: Normal grading expectations, student option S/U, or all S/U are the key options
- Assessment modalities: Especially between (high-stakes) exams or other assessment tools
- Academic integrity: How to maintain academic integrity, and how to address infractions

Grading policies: The exigent circumstances in the spring prevented deliberate consideration of alternate assessment plans, and limited time to address equity issues with students around such elements as access to technology (internet speeds, printers) and learning environments. However, moving into the fall, the committee believes it is necessary to move toward a more conventional model for grading that recognizes changed instructional modalities without significant changes in the curriculum structure and quality.

- Grades are an essential tool for many critical functions, such as gating affiliation for programs (CS in particular) and graduate / professional school applications
- While alternate assessments could be used for some functions, such as competency exams for affiliation after return to residential operation, there are downsides including additional stress on students from these high-stakes exams.

Recommendation 1: The committee believes that any university-level decision on a grading policy should be definitive (to provide clarity to students and faculty) with any change only occurring under the most extreme of situations. The majority opinion is that grading policies should return to the conventional graded format with a suggestion that faculty consider the student option (letter or S/U) if appropriate. The majority does not believe either mandatory S/U or universal student option (student choice of S/U or graded in all courses) would be appropriate as we move forward.

However, it should be noted that there was a very strong minority opinion from student members of the committee that adopting a universal student grading option would help address the underlying inequities in learning during the pandemic including time zone issues, unequal home environments, and illness/bereavement, while allowing students to choose the grading option that works best for their needs and situation.

Recommendation 2: If the fall structure mandates a large fraction of students in remote (home) online learning situations, resources should be prioritized to ensure students are not disadvantaged by this model due to technological limitations or learning environments. Flexibility with respect to course requirements, timeframes, and metrics will likely be necessary to achieve this goal. Ensuring faculty understand the challenges will also be a necessary communication. The university must also provide sufficient financial resources towards securing technology solutions for these students.

Assessment modalities: Within the residential instruction model, in-person exams have evolved as an efficient assessment that in many cases are not necessarily the best assessment. The online environment provides the need, as well as an opportunity, to encourage faculty to consider alternate assessments that address and challenge more creative expressions from students.

Recommendation 3: CTI should identify and/or develop resources to help faculty to move away from exams to alternate assessments including projects, presentations, design efforts, etc. in courses where such assessments are appropriate. Wherever possible, these resources should include concrete exemplars from a range of disciplines alongside more general guidelines.

Academic Integrity: The town hall meeting with AIHB (academic integrity hearing board) chairs and interested faculty confirmed many of the challenges with academic integrity in the remote delivery modality. The general consensus was that violations increased by at least a factor of two and in some cases may completely overwhelm the adjudication procedures in the Academic Integrity Policy. Online sites such as Chegg, Course Hero, and Varsity Tutors provide increased opportunity for infractions with limited potential for discovery (with CS as a notable exception given technical tools to monitor for code commonality).

There are multiple approaches to addressing AI issues, but most center around either a "top-down" effort to ensure exam integrity (e.g. proctoring, lockdown browsers) or around redesign of assessments (e.g. heavier reliance on essays, homemade question banks etc.). While the latter is clearly preferable, it requires considerable effort to design fair and meaningful problems and are often time-consuming to grade as well. However, shifting the emphasis of assessments from conventional high-stakes exams will be a necessary part of the online assessment strategy.

Addressing this issue will require substantial focus, diligence and potentially resources. There does not seem to be *appetite* for extensive and invasive online proctoring of high-stake exams, but this needs to be included within a menu of options where other solutions are not viable. There is unlikely to be any technical solution that can broadly address this issue, but there are several that can help to mitigate the potential and reduce the impact.

Some level of central coordination, especially around the internet-based sites, will be critical. Distributed effort among the various colleges leads both to unnecessary duplication of effort, but also reduced efficacy due to limited knowledge.

Recommendation 4: In discussions of the fall academic calendar options, the impact of schedules on academic integrity should be carefully weighed. The committee strongly believes that calendar options that include in-person exam periods (either at the end of the semester or after a significant portion of the semester) would be the most effective means to minimize academic integrity issues around exam-type assessments. Addressing academic integrity must, however, be balanced against other challenges raised by in-person exams including TA and student safety, psychological stress of high stakes assessments, and logistical challenges of administering both in-person and remote exams for a single course.

Recommendations 5: The committee recommends a three-pronged effort to manage academic integrity in an online environment: (i) education and discussion, (ii) reduction of motivation and opportunity, and (iii) coordinate efforts to address infractions at the university level. Details of these recommendations are more fully enumerated in the full report. Key elements include:

Education and discussion: Academic integrity be intentionally discussed during the early weeks of an online semester and expectations clearly defined for students and faculty in course syllabi.
Assist efforts to address infractions at the university level: The committee recommends the creation of a central office (likely under the Dean of the Faculty's office) that would be able to assist unit

AIHBs in addressing time-intensive investigations and large scale violations of Academic Integrity, including coordinating discussions with online sites such as CourseHero and Chegg.

Reduction of motivation and opportunity: Reduced reliance on high-stakes exams and structuring of assessments can significantly decrease potential for AI violations. However, the committee is keenly aware that many options are applicable to only a subset of courses and that many options entail significant faculty/staff effort. Despite the challenges to maintaining academic integrity in online exam formats, we do not believe that online proctoring is a viable solution.

More Extensive discussion of these recommendations:

Education and discussion: Academic integrity be intentionally discussed during the early weeks of an online semester and expectations clearly defined for students and faculty. Key elements:

- Required **Course Academic Integrity Policy** section in all syllabi with explicit statements about what is and is not permitted. This should be particularly detailed with regard to exams, use of online resources in homework and exams, and collaborations.
- Disseminate recommendations for faculty (through the Dean of the Faculty office) to develop and reinforce a sense of "community at a distance" to discourage AI violations (perhaps useful but probably of limited direct impact).

Coordinate efforts to address infractions at the university level: The committee recommends the creation of a central office (likely under the Dean of the Faculty's office) that would be charged with coordinating Academic Integrity investigations and resolutions across the campus. This office would, for example,

- Coordinate centrally orders for removal of copyright materials from sites such as Course Hero and Chegg
- Negotiate with sites to obtain identifying information on violators (IP addresses, accounts) that could be used to support investigations within colleges
- Proactively monitor sites for activity in coordinate, especially, with early gateway courses where violations are most prevalent
- In the event of large-scale violations in a course, empower this entity to facilitate and manage primary hearings to reduce impact on teaching staff.

Reduction of motivation and opportunity: Reduced reliance on high-stakes exams and structuring of assessments can significantly impact potential for AI violations. However, the committee is keenly aware that many options are applicable to only a subset of courses and that many options entail significant faculty/staff effort. In parallel, there are relatively low-cost solutions that will help the university address and manage some of the online sites. This is a menu of options that will only be appropriate for a subset of courses.

Managing online sites and tracking students that contribute materials to these sites:

- Encourage inclusion of copyright notices on all materials downloaded to students; the existence of the copyright will facilitate demands for offending material to be removed from online sites
- CTI and CIT explore and/or develop the ability to watermark PDFs that are downloaded by students from Canvas (much like research articles). While this can be circumvented by students, it increases the effort and makes distribution to offending sites an intentional decision

Proctoring options:

- We do not believe that online proctoring is a viable solution to the academic integrity issues

Exam modifications:

- Shift exams from short / specific answer to open-ended and complex questions
    - Difficult to implement and grade in large courses
- Oral exams (in-person or recorded with random check)
- Use of one-way (non-return) questions in exams through Canvas; for maximum security choose options to display just one problem at a time and disallow backtracking
    - numerous issues including additional stress to students
    - pedagogically undesirable but may be a necessary option in some circumstances
- Question banks for multiple choice … effectively different version for different students
    - Training from CTI for Canvas tools to randomize values / randomize physical situation
    - Alternative would be N exams for a given course, randomly assigned
- Random or selected in-person "recheck" via oral exams / discussion
    - How to address bias in the recheck? This was a significant concern in the committee.

Exam scheduling:

- University scheduling of exams to minimize overlap for students, and pressure of multiple assessments
- Reconsider recommendation of more numerous, but lower weight, assessments in the online environment; students indicated increased stress / work from this increase
- Provide alternative options to the Spring 2020 requirement of a mandatory 24-hr window for exams
    - Enable faculty to provide two options for timed exams 12 hours apart to address time-zone challenges
    - Provide faculty with guidance on advantages and challenges of 24-hour (or longer) untimed exams

Charge 6: How do resource limitations (TA time, faculty time) impact the quality of online courses?

Numerous issues have been identified in this report where resources are anticipated to be a major concern. These have no easy answers and it is unclear if there are actionable recommendations that this sub-committee can suggest. But there are issues that need to be addressed at some point:

Recommendation 1: The committee identified numerous specific needs as well as opportunities to enhance the effectiveness and robustness of online content delivery. Many of these recommendations require additional resources. We recommend the formation of a new implementation committee, including representatives from finance, to look at key resource challenges.

- Identifying and funding sufficient TA resources to manage increased numbers of sections in a hybrid model

- Identifying potential support (e.g. for graduate students) to assist faculty with course development over the summer

- Managing the scalability of training and support resource within CTI and CIT – both of which are heavily leveraged already to support the transition

Managing Course Interruptions: Independent of the fall format, some faculty, TAs, and other instructional staff are likely to become unavailable due to Covid-19 or other medical situations (which may be more frequent than normal given the critical focus of the medical system around Covid-19). Instructors may also struggle with other issues (e.g. death of a family member) that will impact their ability to teach.

Courses do not generally plan for extended instructor absences, and few instructors include this possibility within the syllabus. Graduate TAs support in courses will also be impacted. While there is no official TA sick day policy at Cornell, the graduate school has indicated that TAs will not be dismissed if they are self-isolating due to coronavirus. It may be appropriate to formalize these protections for the fall to address likely situations.

All classes should include in their syllabus contingency plans in the event of instructional staff (including TAs) unavailability (for any number of possible reasons). While there is unlikely to be a universal solution to this issue, several potential solutions can be suggested:

- For asynchronous online classes, lectures and content could be developed and recorded in advance and be available to continue uninterrupted. This would provide a buffer for absences, with a recommended two-week buffer to cover most contingencies.

- For synchronous and highly interactive courses, optional topic(s) (tangential project or theme) could be included as part of the syllabus. In the absence of any disruption, these topics would be introduced in the last weeks; if there is a disruption, such topics would be covered early.

Contingency plans would need to also recognize other staff limitations, especially time constraints from modified responsibilities. For example, simply transferring responsibilities to remaining TAs would likely result in excessive workloads and would be inappropriate. Discussion and validation of contingency

plans should be completed before the semester begins to provide time for thorough discussion and evaluation, if necessary, through appropriate channels (e.g. ombudsman).

Recommendation 2: The university should formalize a plan to address potential instructional staff absences for fall courses. These would include strongly recommending that all courses have an explicit plan for instructor and/or staff absence for a minimum of the anticipated two-week quarantine period. Faculty should be encouraged to consider longer absences for staff due to actual infections and other conditions.

There was some support among the committee for an explicit recommendation around supporting an official graduate assistant sick day policy for health and mental health issues. While probably beyond the scope of this committee, the graduate school should consider formalizing a policy around TA absences (sick days) for valid physical and mental health reasons. This policy should explicitly assure that TAs cannot be dismissed from their position for failing to complete teaching responsibilities on such days.

Report of the Subcommittee on Effective Online Delivery

1. Critical Tools for remote teaching

Transitioning the almost 2,300 courses to remote instruction in the spring semester identified the two most critical tools required, Canvas and Zoom, and provided the university with the opportunity to build expertise at scale. Canvas is a cloud-based learning management system that allows instructors to manage a wide range of course support including digital materials distribution, assignments, integrated course calendars, communications between faculty, course assistants and students, grading, and other aspects of instruction. Zoom is a web and video conferencing service that provides a platform for remote course instruction including synchronous live sessions that can be recorded and viewed by students; the tool includes online meetings and webinars, polling, breakout rooms, etc. Panopto also proved to be extremely useful as an excellent recording platform for asynchronous content delivery.

The Center for Teaching Innovation (CTI) and Cornell Information Technology (CIT), together with CU Library Services, Student Disability Services (SDS), eCornell, Learning Strategies Center (LSC) and other units have prepared materials and help desks to support instructors and students both with these tools, and with pedagogical changes required for the remote instruction. CIT also increased VPN capacity and worked with Zoom to improve privacy settings.

Canvas and Zoom saw unprecedented usage after April 6th and were able to sustain Cornell classes without major interruptions. Note that 30% of spring semester instructors had not used Canvas prior to April 6th, and an even higher percentage of instructors had not used Zoom.

During a typical teaching day we saw:
- Over 7,000 Zoom meetings (classes and other meetings)
- Around 100,000 Zoom participants per day
- Around 1,000 Zoom recordings
- Around a million Canvas actions taken (students opening course materials, participating in quizzes, etc)

CIT reports that Zoom has been a very responsive company to work with. For example, Zoom increased the allowable number of large Cornell meetings (1,000 attendees or more) at no additional cost.

Of the immense number of Zoom sessions (teaching and all other sessions since April 2020), Cornell only experienced 4 "Zoom bombing incidents" and these were due to various simple setup errors by the hosts. CIT and CTI invested a great deal of effort in outreach and training to help avoid these problems. In addition, Zoom made several important modifications to the application to make it easier to ensure privacy with better controls around screen sharing, improving encryption, and requiring passwords for all sessions. Finally, Cornell IT reviewed our contract with Zoom leadership ensuring privacy rules and safe data storage requirements were being met.

For the fall semester and beyond, we believe that Zoom continues to be the most robust, safe and appropriate video teleconferencing platform for Cornell. All of our peer institutions (as far as we know at this point) are planning to continue using Zoom as well. We know of one partner institution that has switched from another platform to Zoom. Based on the experience in the spring, there is high

confidence that these tools will have the capacity and structure to support the entire fall curriculum if it is necessary to be completely remote (no in-person instruction). We acknowledge that there are concerns with Zoom's privacy policies for international meetings. Please see for example this link: https://blog.zoom.us/wordpress/2020/06/11/improving-our-policies-as-we-continue-to-enable-global-collaboration/

Given the variety of technology challenges delivering international content, especially those which censor content, CIT will continuously monitor and investigate potential alternative solutions. CTI will develop teaching related resources and share details on the CTI webpage when alternatives become available via the CIT vetting process.

Recommendation: Zoom should be continued as the video teleconferencing platform for Cornell. In addition, we recommend that more instructors consider the use of Panopto as a recording platform for asynchronous content delivery.

2. Pedagogy and course design for remote teaching

CTI provided critical support for instructors moving to remote teaching during the spring semester. CTI's capacity was stretched thin: the unit quickly developed "around the clock support" structures, evening shifts, and scaled support through live and recorded webinars (in addition to more personalized consultations). Recorded webinars were accessed more than 2500 times. Topics in order of popularity were: "Getting started Moving Online", "Getting started in Canvas", "Using Zoom for Teaching Online", "Using Panopto for Creating and Sharing Video Online", "Polling for Online Classes", "Online Assessment", "Inclusion, Accessibility and Accommodations in Online Learning". In surveys, 94% (77/82) of respondents indicated that participation in CTI webinars to support remote teaching was a good use of their time.

Live webinars had a total of 545 participants. In addition, another 439 instructors participated in departmental or college trainings. The "drop-in office hours" were used by 573 instructors. 2228 support tickets were answered by CTI staff.

eCornell instructional designers and library staff provided additional support and expertise. CIT significantly ramped up Zoom support and answered an additional ~2000 questions related to Zoom.

Feedback is being collected now to help us better understand any challenges faced by faculty and students during the exigent circumstances created by the onset of Covid-19 and the campus being closed due to state mandate.

Guidance for instructors who will be teaching completely remote classes (no in-person component) is based on the spring semester experience and student feedback. Instructors will be asked to structure course materials such that, at a minimum, (quoting from the Provost message to instructors from May 27th, 2020) they meet the following:
- shorter video lectures are pre-recorded and uploaded for students in advance
- instructors communicate regularly and clearly about what is required versus optional material
- a sense of course community is created, and frequent opportunities for instructor/student engagement are presented (including for students in different time zones)

- course materials are accessible to all students (see also section 4)

Implicit in these requirements is the need to provide sufficient opportunities for the "substantive interaction" that is central to the Cornell experience. The nature and hours of such interactions will vary widely depending on the course content but should be assured in any completely remote structure.

Faculty will need to work with their colleagues and the Center for Teaching Innovation (CTI) to design course components that may not translate easily to an online format, including traditional timed exams (see also section 3).

We would like to stress that successfully reconstructing courses for this new format and environment will be challenging, and that considerable preparation time will be required to achieve these goals. We note that while these instructions have elements of good online design, these classes do not have to be "online" classes in the classic sense of a completely self-paced high-production online course such as produced by eCornell, for example.

We believe that communication about these expectations, and support for instructors has to happen at several levels, including at the departmental, college, and university level. Department Chairs should be clear as they discuss expectations with faculty, CTI resources should be clearly structured to help with each of the goals, and opportunities at college and university level for support and discussion should be publicized.

We note that due to scheduling and load factors, a significant number of instructors did not have a course scheduled this past semester. The estimate is that 25% of the faculty scheduled to teach this fall did not teach this spring. They do not have experience teaching with Zoom and some percent of these may also have little or no familiarity with Canvas. These faculty will need to recognize their special training need and prepare as soon as possible for the transition to remote and online teaching in the fall. Resources prepared by CTI for the spring semester move to remote teaching can help them begin. We also expect that, among faculty who did have a course assignment this past semester, many will want more guidance or training to better prepare for their fall semester teaching.

The Center for Teaching Innovation is preparing accelerated training and resources to support fall instructors through:
- lessons learned from the spring experience,
- online workshops on course development for remote delivery
- resources dedicated to online assessment, creating inclusive online learning environments, engaging students, etc.,
- consultations with instructional designers to walk through course planning,
- online drop-in hours, and
- departmental or college-based workshops

Adding to that, CTI plans to offer a 2-week curriculum for remote course design that will be offered repeatedly throughout the summer.

Instructors involved in the Active Learning Initiative adapted active learning strategies to remote courses of different sizes. Guidance, challenges, examples, and lessons learned can be found in this document.

Recommendation: Clear communication about expectations, and support for instructors has to happen at several levels, including at the departmental, college, and university level. Continue increased support efforts including eCornell/library and supplement those efforts by facilitating faculty meetings over the summer to exchange ideas, develop recommendations for critical elements that may be discipline-specific, such as assessments.

3. Addressing Academic Integrity in a remote teaching environment:

Anecdotal evidence suggests that incidents of academic integrity this past semester were more widespread than we have seen in the recent past. For example, in one "gateway" large enrollment class there seems to be compelling evidence that more than 100 students violated AI on one exam. This was likely due to a combination of increased pressure during a difficult situation and increased availability of cheating options in online settings where proctors and other oversight was absent. For example, services such as Chegg allows students to share their exams and get answers from other people in real time.

Going forward it is likely this will be an issue in the fall semester in both the all online and remote teaching environments. Given the magnitude, University Academic Integrity Hearing Board protocols cannot handle the potential flood of cases. This begs the question as to how best to manage the problem proactively. Possible solutions include:

- Have more frequent less "high stakes" deliverables
- Limit the open time horizon on deliverables
- Have exam questions that are randomly assigned from a bank of similar questions throughout the exam
- Online proctoring
- Continuation of S/U grading option with the addition of "qualifying exams" for highly demanded majors

Each of these options has pros and cons. It would be difficult to ask faculty to follow one modality and instead we should make Deans, ADAAs, Dept. Chairs and all faculty aware of the issues and provide the alternatives listed above for their consideration. We believe the best path is for a local solution to be agreed to for faculty within their respective departments that aligns with the University's AIHB codes, codes of conduct, and privacy rights.

Recommendation: Since the best solutions for preventing academic integrity problems vary with the course setting, size, and material, we recommend that the decision about how to adapt courses be left to faculty, in consultation with their departments. In order to assist faculty with the decision, we recommend that the ongoing effort to develop guidance for faculty about the options be continued, perhaps through the Dean of Faculty Office. CTI can serve in a supportive function, working with faculty to investigate additional tools that may be needed (such as online proctoring solutions or additional Canvas exam settings) for the fall.

4. Facilitate accessibility of teaching materials

As always, whether a course is taught in person or remotely, course materials should be accessible to all students. New materials developed for online courses should be designed to be accessible to individuals with vision and hearing disabilities (i.e., text readable by screen readers, audio transcription and video captioning, alternative text to describe images and graphics, descriptive hyperlinks). This will enable

Student and Disability Services to assist with accommodation of other individual disabilities upon request as has been the norm with in-person teaching. Individual faculty members and their departments have primary responsibility for ensuring that their courses meet the baseline accessibility standards. To support this effort, Cornell has acquired university-wide licenses to additional tools that will assist in this effort. The table below lists these tools:

Name	Purpose	Comment
Ally	Automatically provides students with accessible versions of many course materials, indicates the degree of accessibility of course materials, and instructs on how to generate alternative accessible formats	Integrated into Canvas
Equidox	semi-automated PDF remediation software solution that converts inaccessible PDF documents	
Ava	Zoom captioning (live)	Better quality for technical content

The Center for Teaching Innovation and CIT provides both consultation services and training to use specific tools to facilitate accessibility in an online learning environment. A team of CTI and CIT staff are training a number of staff volunteers drawn from all colleges, to support faculty use of the new tools.

Additionally, the library can be a valuable resource to faculty in their quest to identify teaching materials that are already fully accessible and, in many cases, the judicious choice of such materials greatly alleviates accessibility issues. Ways to contact and work with the library will be clearly identified.

Recommendation: In addition to the ongoing efforts, we recommend that departments identify and train additional staff members to support fall instructors. Publicize the emerging training resources and websites:
- *CTI Workshops & Resources (*URL and training resources and workshops under development now)
- *CIT Workshops & Classes*

5. Hardware/access/technology help for instructors and students

Wifi coverage for student on campus: If students are on campus and participate in classes remotely, high speed internet access from dorm rooms and dining halls will be essential. CIT staff are in the process of investigating weak wifi coverage spots (by looking at data from wifi access maps and by visiting spaces) and will prepare proposals for how to address them.

Home office technology needs: We know from the Spring 2020 remote teaching experience that home office technology is critical to successful teaching and learning. In all Fall 2020 scenarios, instructors (faculty and students) may have to teach from home, and learners may be off campus. For example, access to stable internet and adequate hardware was one of the top concerns for graduate and professional students, as revealed in a recent survey. Financial issues and delays in supply chains have to be addressed as best we can.

Recommendations:
- Facilitate ways for instructors (including TAs) to retrieve equipment to teach from home if necessary. We note that plans and oversight for access to buildings and offices are being developed in the C-ROR committee.
- Address computing needs in financial aid packages (including need for data plans or wifi hotspots)
- Increase the Access Fund for undergraduate, graduate and professional students
- Investigate and facilitate remote access to software such as Adobe Suite (see section 6 for more detail on software needs for remote work)
- Accelerate central procurement of additional laptops, tablets, mobile hotspots, tablets with styluses etc. that can be given out as part of the lending library. This has to be done as soon as possible, to allow for delays in the supply chain. Also identify ways for departments to surface technology needs, including for graduate students, and join larger central procurement efforts.

Classroom technology: During the Spring 2020, many of the issues with respect to classroom technology did not rise to the level of a concern as faculty were forced to teach from their homes during the full NY Pause. As we begin the return to campus and with expectation that classrooms will be either in use (hybrid) or available (even for fully online), classroom facilities to enable a minimal acceptable level of lecture recording will become critical. Adoption of high-performance lecture capture (or distance learning) technologies is likely to be prohibitively expensive, but smaller scale technical enhancements would be appropriate:
- Remote RF/Bluetooth label microphones for audio capture that would integrate with classroom computers for faculty computers with Zoom
- High resolution and quality "web-cams" with Zoom capability for lecture capture; some minimal funds for students to actively follow classroom discussion may also be appropriate

Mini-recording studios: In a fully online teaching modality, as well as for development of asynchronous content in any of the hybrid modalities, substantial quality enhancements in recorded materials would be possible with dedicated facilities for lecture capture and presentation. There exist already a limited number of high-quality recording studios both on campus and at the eCornell facilities on South Hill. In addition, CTI has a small self-recording studio for faculty (see CTI link).
However, these studios are probably insufficient to address the potential need.
A number of similar, smaller moderate quality, but still well-equipped recording studios distributed among the colleges could efficiently facilitate the development of online instructional materials. It is also likely that these needs would persist and be useful beyond the Covid-19 crisis. These studios would require only minimal space (<100 ft^2 offices) with, for example:
- Anechoic wall hanging (reduced background noise)
- High quality microphones, both stand mounted and lapel/ear
- Multiple high-quality cameras and lighting
- Blue/green screens (virtual backgrounds), limited backdrops
- Multiple monitor configuration with document capture (paper) and dedicated pen input devices (Wacom type).
- Wall mounted large display (consumer grade 70" monitor) for "stand-up" lectures with high-quality capture

- Options for use of an in-room computer configured for multiple capture modes (Panopto, other) or connection of faculty computers to a USB-3 or similar docking station
- Training and support for the equipment and use

These hubs could be based on existing studios with a well-defined investment limit (target less than 5K/studio. In addition, readily available hardware (COTS) as a secondary preference for rapid deployment of additional rooms if warranted by demand should also be made available.

Recommendation: Encourage colleges to stand up a number of smaller, but still well-equipped and moderate quality, recording studios. Assemble a list of specific technical requirements and possibly coordinate a purchase order.

6. Adoption of new tools and specialized software needs

Across the colleges, a number of new software services emerged as essential to support certain teaching activities. Others are being added in consultation with faculty who have identified teaching needs.

Apps on Demand (AWS AppStream) makes suites of software applications that used to be available in physical computer labs accessible to students on their desktops, directly through a Canvas integration. The service has only been available and piloted very recently and became extremely important during the unexpected remote teaching situation. Apps on Demand became a critical vehicle for many instructors to deliver content remotely. In the spring, a small group of pilot classes (for example in Engineering, Architecture, Finance) went forward, with departments bearing the cost of software licensing. Cornell has now made it possible for all instructors to use the service in the fall semester. Departments would continue to arrange for the software application licenses. We have seen an accelerated adoption by instructors and students due to the emergency and will continue to see it used.

A second example is classroom polling. Both Poll Everywhere and iClicker Reef for online instruction was free. Faculty reported good success using the services and continued use of polling should be considered for the fall semester. In general, faculty point out that a university-wide solution for polling, and central support for polling software should be explored.

A third example is Gradescope, a software designed to streamline grading of assignments. Gradescope can make grading more efficient and equitable and facilitates grading among TAs and instructors who may be in different locations. Made available to Cornell this spring, many Cornell instructors adopted Gradescope when they moved to remote teaching.

Hypothes.is is a social annotation software that allows students to share notes and commentary, and engage in discussion with instructors and other students, inside course readings. It integrates with Canvas and is available to instructors as part of a free pilot this fall.

Feedback Fruits is a peer review software that helps faculty manage students engaging in peer review of course assignments. It is integrated with Canvas and is available to instructors as part of a free pilot this fall.

Additional available learning technologies can be found on the CTI website.

Several departments have submitted additional statements of need for specialized software. For example, music and performance instruction depends on near-zero-latency communication, and high-

quality audio. It is exceptionally challenging for remote instruction to accurately simulate the process of making music in person. The department of music has explored technology options that would improve the speed and quality of transmitting audio for both online instruction and virtual performance. Several new tools are being explored for fall instruction.

7. Summary and outlook:

Over the past 3 months, university infrastructure, training, and support rose to the unprecedented challenge of supporting an emergency seismic shift from traditional in-person instruction to a purely online format. CIT worked to ensure access and security of technological platforms. CTI worked around the clock to support faculty in shifting the format and structure of their courses. Faculty gathered (virtually) to share ideas, tools, and techniques for innovative coursework and pedagogical design, as well as for supporting students during this difficult public health crisis. Although not perfectly seamless, the success was greater than possibly could have been anticipated and is a credit to the students, faculty, and staff who worked hard to make the most out of an extremely difficult situation.

Moving into the fall, this dedication and hard work will be crucial to our successful adaptation to the new model of instruction that is chosen. Although this adaptation is an enormous amount of work for all involved – students, faculty, and staff – and is taking place against the backdrop of one of the most difficult times in many of our lives, it also represents an unprecedented opportunity. Never before has the university community collectively spent so much effort and attention at one time innovating and sharing ideas about enhancing teaching and education. We are also seeing accelerated adoption of innovative tools and exploration of new ways of teaching. This is bound to have a profound impact.

Some examples of innovative teaching experiences, new ideas, experimentation with novel educational technology, and substantive engagement around teaching and learning in the remote teaching world were described in the following Cornell Chronicle articles:

https://news.cornell.edu/stories/2020/05/bending-create-homemade-musical-instruments
https://news.cornell.edu/stories/2020/04/lab-instructors-adapt-remote-teaching
https://news.cornell.edu/stories/2020/05/students-faculty-make-art-time-coronavirus
https://news.cornell.edu/stories/2020/05/six-stories-six-weeks-virtual-learning

Report of the Subcommittee on the Student Experience

Rationale

Co-curricular activities are a key component of the Cornell experience, and help build a sense of belonging in the Cornell community. Involvement in co-curricular activities anticipates student wellness, student success, and student satisfaction, at an individual and institutional level. Even after the March shift to online delivery, co-curricular groups at Cornell report thousands of students remained active in their offerings. Our surveys and stakeholder conversations also indicate that building community in the classroom reduces anonymity, which not only enhances student learning but also likely helps mitigate academic integrity violations.

Following key recommendations, we include an expanded list of actions and note specific units whose current work, when amplified, will be critical to bringing the Cornell experience alive in an online world. We end by including a short summary of the data collection and analysis efforts that inform our recommendations.

Key Recommendations:

1. **Strongly encourage all online/remote courses to include an experiential component to build community and belonging in the classroom.** These components can draw from the four types of co-curricular programming described on page 35 and should aim to increase student engagement, student success, and student satisfaction. A component can be a range of activities from something as specific as how an assignment is prepared or how a breakout room discussion is facilitated to something as broad as a designed collaboration with a unit that offers co-curricular activities.

2. **Make resources available to instructional faculty to assist and enhance inclusion of experiential components in academic course work:**
   a. CTI to build an instructional video to help faculty/staff understand the value of the co-curricular/experiential component and offer design principles for co-curricular integration into the substantive curriculum. Integration to also be explicitly noted and encouraged in *all* webinars and training sessions offered to faculty and instructional staff.
   b. SCL/Dean of Students Office to revise and enhance the 'Virtual Engagement' site and make it a key nodal location that highlights a range of co-curricular activities that have been taken virtual.
   c. Work with key units/websites (a full list is available on page 33) that focus on experiential and virtual engagements to create links to each other, building an ecosystem of sites that point instructional faculty towards a variety of co-curricular programming.

3. **Encourage relevant co-curricular units to work with faculty and instructional staff to develop collaborations.** This includes specific ideas like bringing in 'developmental' co-curricular programming into classes with many international or professional focused students and longer term collaborations with units like OEI to prepare for community-engaged activities, or the Botanical Gardens or Cornell Cinema (while much of the collaborative work is longer-term, a small start now may yield large dividends later and the few experiences we see should be amplified through recognition).

ACTION ITEMS

This section offers a list of resources that faculty and instructional staff can draw on to bring experiential learning into online/remote instruction. It also suggests enhancing certain resources and websites to create central nodes for faculty to locate information on co-curricular activities.

Cornell Web Resources for Virtual Co-Curricular Programming

We build here on two key recommendations # 2b., 2c.

2b. Revising and Enhancing DoS Website 'Virtual Engagement'

- There is currently a well-utilized resource in Cornell's web architecture that offers support to individuals, student clubs, and academic/residential units looking to develop virtual co-curricular programs: https://scl.cornell.edu/get-involved/virtual-engagement
  - This resource was developed by SCL staff in March 2020, when we had to make the rapid pivot to virtual engagement
  - These pages, and underlying tabs, have received well over 15,000 views and clicks since they were established
- The Dean of Students Office will charge a working group to use Summer 2020 to revise and expand these virtual programming guides. The working group will:
  - develop plan to get this link re-posted in numerous web locations so that it is more noticeable and accessible, creating an ecosystem of web sites for faculty and staff
  - work with CTI to produce a training video for staff taking co-curricular programming online
- This work to be complete by mid-August 2020

2c. Linking key websites

Below is a list of departments/units that faculty can engage with to offer integrated co-curricular experiences with their courses. It is this list that the DoS office will focus on in their effort to link key websites offering resources.

1. Campus Activities
2. LGBT Resource Center
3. Asian and Asian American Center
4. Physical Education/Outdoor Education
5. NatureRx
6. The Tatkon Center
7. The Johnson Museum
8. The Lab of Ornithology
9. The Botanic Gardens
10. The Office of Academic Diversity Initiatives
11. Global Cornell (which includes the Einaudi Center)
12. Office of Engagement Initiatives

LEARNING FROM SPRING ONLINE & CO-CURRICULAR UNITS

Inventory of 12 Campus Units who took programs virtual in Spring 2020

The subcommittee conducted an inventory of 12 campus units perceived as leaders in virtual co-curricular engagement to glean best practices. Their recommendations for virtual co-curricular engagement in the fall include:

- social media posts that "show people engaging and having fun"
- schedules that mapped out programming in advance
- informal social and activity-based programs for entertainment (movie nights, game nights, virtual escape rooms), health (yoga, meditation) and community building (LGBT RC peer mentoring/support groups, virtual K-12 tutoring) were especially popular and combatted "Zoom burnout"

They suggested the following resources would help them in the future:

- **CIT training on Zoom** security (and for other online programming)
- **a system for coordination/collaboration** to avoid "reinventing the wheel" and allow groups to learn from one another
- **a coordinated calendar with activities from all groups** pushed to students; should be customizable so students can choose e.g. "fitness," "nature," "trainings," etc.
- **Canvas sites to host preparatory materials**
- **International students expressed that academic research and project teams would supplement their online experience better than student organizations**, as they allow for more independent research but still encourage small group work and one on one interaction. These students also requested that student organizations be conscientious of time zones and encourage clubs to meet over the weekend to be inclusive of students in different time zones.

Stakeholder Conversations to understand student engagement and experience

The university's move to online learning this Spring left students in uncharted territory, not just with regard to their academic progress but their mental and emotional well-being. The task of the Student Experience subcommittee was to lay out ways to improve the experience for students in the fall. Through focus groups, surveys, and much discussion, we determined that students are spending copious amounts of time on Zoom, and only offering co-curricular activities by adding additional time will not be effective. Thus, we must merge the co-curricular experience with the academic one. In the table below, we have detailed examples for how to do so, including asking students to attend career services events in lieu of a homework assignment or assigning students projects that inspire creativity.

> Definition of Co-Curricular: Through our information gathering, we determined that students desire increased community-engagement during the online experience while simultaneously

feeling fatigued from completing coursework online. As such, we concluded that in order for co-curriculars to be sustainable and productive in an online model, they must interact with students' academic curricula. For the purposes of our examples, we are focusing on co-curricular as experiential learning that complements course curricula. Co-curriculars might include performance and creative opportunities, social engagement, wellness, and developmental opportunities such as career development, etc.

Ways to integrate co-curricular and substantive learning in the classroom

Type of Co-Curricular Activity (defined by focus)	Impact	Examples	Oversight/Support provided by
Developmental	Students are largely concerned that the pandemic will stunt their professional development. Many hope that next semester will re envision career-development opportunities to better suit the online model.	One example of this is featuring alumni guest-lectures as a part of course opportunities. A college-specific example of this is providing opportunities in courses for architecture students to engage with alumni and even shadow working architects in firms that have moved their operations online. Another college-specific example is to offer more engineers the opportunity to be on project teams, so they are able to get more hands-on experiences. Two central level website links are to Global Cornell or Experience Cornell both of which offer links to various internships, fellowships and can also provide a link to various lectures available at Cornell that faculty can bring back into their classes.	- Colleges/Depts - Central Units
Wellness	Students are struggling to take care of their emotional and physical health at home, and it might help students if we build wellness opportunities into courses.	One example of this is a homework assignment asking students to go on a walk outside and take a "selfie" while on the walk. Another example is assigning students to attend an event put on by Cornell Recreational Services or, especially for Freshmen, at the Tatkon Center.	- Cornell Health - Residential Life
Performance &	Some students expressed	One example of this is an assignment to	Student Clubs,

Production	interest in more opportunities to explore creative outlets in the online model.	produce a "vlog" or video series about a topic in place of a more formal examination. Another example is assigning musical pieces or poetry related to the course topic in place of a formal homework assignment.	• Dept-led (Music, PMA) • Johnson Museum • Cornell Cinema
Social & Sustainability	On campus, Cornell places great value on engaging with our local community. Many students expressed that the online experience is lacking in community-engaged learning.	Course instructors should consider providing opportunities for students to do service projects, such as spending a day volunteering to call elderly persons at nursing homes. Another example is creating course assignments such as gardening or engaging in one's local environment (taking pictures of plants near one's home, setting up journaling to follow birds, the facilities in which people are living, the essential services staff they engage with etc.). A central unit example is OEI 's "Serve in Place" initiative that allows students to both work with communities wherever they are and to offer community partners a range of resources while keeping social distancing and community health considerations at the forefront.	• Student Clubs • Dept-focused • Central Units

Note: In-practice types of activities and outcomes overlap.

Report of the Subcommittee on International Students and Instruction

Roughly 20% of all Cornell students are international, coming to campus from over 100 countries. Due to ongoing travel restrictions, significant visa-processing delays, and other health and safety concerns, there is a significant chance that many international students will be unable to be in Ithaca for the fall semester. At the same time, it is unlikely that any of our students, staff or faculty will be traveling as freely across the globe as they did pre-COVID. Given these restrictions, we make the following recommendations:

1. **We recommend that the university work to provide fall semester, residential options abroad for international students who are not able to return to Ithaca this fall.** Referred to as "study away," these options would be available in international locations where Cornell has significant numbers of students, good university partners, and student life can be provided in a context that matches the Cornell Ithaca campus for health and safety. While this 'study away' option cannot (and should not) replace or replicate the on-campus experience at Cornell, students in these locations would have the opportunity to be with Cornell peers and have access to university facilities while taking all or most of their classes online from Ithaca.

At present, the locations where we can offer these study-away options are likely to include Shanghai, Beijing, Hong Kong, Singapore, Seoul, Hanoi, New Delhi, and Aix-en-Provence. At each of these locations:

- All Cornell classes will be available online and asynchronous, and students who enroll in one of these study-away options will be mostly taking these Cornell classes;
- The Office of Global Learning will take the lead in publicizing these options, advising students who have questions, assigning students to locations and connecting with college advisors for enrollment;
- The same tuition will be charged for a semester of online courses, whether the student is in the US or abroad;
- Room/board determined by the partner (in consultation with Cornell);
- Decisions made as soon as possible regarding residence options;
- Students move in when the semester starts in the local university OR when the semester starts in Ithaca, whichever comes first;
- Health insurance provided by Cornell's SHP and international services provided by Cornell's contract with iSOS;
- Partner responsible for ensuring that all local regulations are met, in coordination with Cornell legal counsel and overseen with an MOU/Program Agreement;
- Partner responsible for providing a COVID-19 preparedness plan – students abide by local decisions regarding health, safety, travel and privacy; partner decides if students need to be sent home should a second wave occur;
- If there is a second wave and students are sent home, partner universities refund pro-rated room/board costs.

2. **We recommend that additional co-curricular programming be offered for international students who cannot be on campus:** For students in these study away locations, we recommend that the office of international affairs offer a set of ways to connect with staff, faculty and students in Ithaca, including:

- Organizing on-site alumni groups to interact with students;

- Enlisting "Global Ambassadors" (faculty) to provide programming and connections between the students and campus;
- Fostering peer-to-peer buddy networks between students in Ithaca and international students off-campus – ideas for connection include "coffee without borders," presentations by the International Student Union, and more;
- Enlisting in-country companies and organizations to provide internships and networking opportunities.

3. Ensure that all instruction is accessible to international students who may be situated across a variety of time zones and for whom English may be a second or third language. Consult these excellent guidelines from the John S. Knight Institute.

For international students surveyed for this report, there were some key best practices:

Students complained of poor internet quality, which was particularly disruptive for asynchronous downloading and watching of lectures. We recommend that international students studying from home receive access to devices (hot spots) that will allow them to access the internet more easily.

Time zone differences came up frequently as obstacles to learning. Some recommendations:
- Instructors find out which students need time zone accommodations at the beginning of class and embed accommodations for teaching between 8:00 a.m. and 10:00 p.m. into their syllabus (so that students do not have to request accommodation repeatedly over the semester);
- Provide options at different times of the day for office hours (morning one day, afternoon another day);
- To the extent possible, assign exams according to time zone, so that students are not taking exams during off-hours;
- Assign study groups, discussions and group projects by time zone.

For international students in different time zones, having access to recorded lectures was key. We recommend that, as possible:
- Instructors upload recordings as quickly as possible after the lecture is recorded or provide the recording beforehand;
- Instructors provide notes for the lectures, if possible (to guide the watching, like an outline might be used if in person).

Students indicated that they had good interactions with professors but very little social or class-related interaction with other students if they did not know those students beforehand. Social isolation is an issue. Some suggestions included:
- Promote discussion in class;
- Call on people quickly when they raise hands;
- Design activities with students outside of class;
- But – minimize participation grades;
- Provide etiquette guidelines so students know if they should turn their video on or not, understanding that many people for whom English is a second language read lips to better understand.

4. Assess privacy concerns early on for international students and explore the best platform and modes of delivery for lectures and small group discussions. In most cases, Zoom works well for

meetings abroad but we recommend that instructors ask international students at the beginning of the semester if they have any concerns about privacy online. Given the variety of technology challenges delivering international content, especially those which censor content, CIT will continuously monitor and investigate potential alternative solutions. CTI will develop teaching related resources and share details on the CTI webpage when alternatives become available via the CIT vetting process.

5. Provide access to international co-curricular and curricular programming and content as most people will not be physically traveling but will be able to access international and area studies content from faculty, staff and students in Ithaca and abroad. Content from international and area partners includes intercultural engagement, virtual internships and lecture series.

Intercultural Engagement: To facilitate curricular and co-curricular enhancements and offerings, Cornell faculty and students can work with select Cornell global programs and specific abroad partners, in partnership with Cornell academic units. The Mario Einaudi Center for International Studies is an excellent resource for curricular and co-curricular content from across the globe. For example, the Einaudi Summer Passport Series is a summer-long lecture series designed to connect graduate and undergraduate students, faculty, and the broader Cornell community with global learning opportunities while travel is still restricted.

Staff at Cornell's study abroad locations can also support co-curricular and more limited curricular engagement with home campus students and units. The following programs, where Cornell is consortia member, will be a resource to language teachers to offer content for their classes or co-curricular opportunities:

- CASA Seville (Cornell lead institute)
- Berlin Consortium for German Studies
- Bologna Consortia Studies Program
- Kyoto Consortium for Japanese Studies
- EDUCO Paris

As an example, EDUCO can provide the following resources:

1. Video-conference French language exchanges with French students.
2. A weekly newsletter of cultural events in Paris and France that can support French-language learning.
3. A transatlantic buddy program with our Université de Paris exchange students slotted to leave in Spring 2021, as well as our regular language exchange partners.
4. Video conference lectures and colloquium organized in Paris and streamed to your campus.
5. Real-time visits of cultural sites conducted via FaceTime, for example, to complement what you may be studying in class from the most traditional to the most off-the-beaten-path.
6. Virtual cooking classes to turn oral comprehension into edible fact.
7. Real-time or recorded orientation tutorials to reveal the practical aspects of living in Paris: Using the Métro, how to buy and eat a baguette properly, how to be at table in the French manner, how to adopt the Parisian *gueule*, how to avoid pickpockets. The list is long for these *Tutos d'EDUCO*.

Internships: A number of virtual internships have been offered from international partners during Summer 2020 and will likely continue into the fall, depending on demand. Interns are eligible for one-time awards with opportunities through a variety of programs:

- Institute of Politics and Global Affairs
- Mario Einaudi Center for International Studies
- Latin American Studies Program
- Institute for African Development
- Peace and Conflict Studies
- South Asia Program
- Southeast Asia Program
- East Asia Program
- Cornell China Center
- International NGO partners: Oxfam affiliates, Institute for Food Policy Research, African Development Bank, Management Systems International, Kids In Need of Defense, etc.

The list of virtual internship opportunities from 3rd party providers also grew steadily during May and early June. The Office of Global Learning has worked with partners to identify expanding opportunities and vets possible third-party programs to share as resources.

Lecture series: Many different centers on campus are offering seminar series featuring international content for the fall, including:

- Weekly seminar series from Einaudi Center Area Studies programs (fall)
- Cornell China Center presentations
- Ongoing events hosted by the Institute of Politics and Global Affairs
- Weekly seminar series on the Global Grand Challenge: Migrations

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APPENDIX A – FORMAL CHARGE – QUESTIONS and ANSWERS

Below is the original charge to the C-POT, as well as brief answers to those questions. As noted in the Introduction, the committee expanded the formal charge to provide a more comprehensive set of recommendations. At the same time, the committee concluded that several elements of the original charge lay beyond the expertise of the committee.

Original Charge to the Committee

The committee should consider the implications of a situation in which we need all or most of our classes online in the fall semester, and possibly the spring semester as well, and under that scenario make recommendations to the president about the following questions, not later than June 15. They should also provide intermediate updates to the cabinet every other week.

Should we attempt to offer all classes online, or only a restricted subset of them? If so, how would we make these decisions: as one example, would it make sense to start upper-level classes in the fall, and then defer freshmen to start in January?

The committee declined to make any generic recommendations regarding the narrowing, sequencing or redirection of course curricula. Curricular planning involves a wide array of discipline specific variables and is therefore in substantial part the province of departmental faculty. Those faculty are already intensely engaged in deciding what courses can and should be offered depending on the general direction taken by the university, the need to provide progression through departmental majors and the available instructional resources. Moreover, given the possibility that significant online instruction may need to continue through the spring semester, the committee decided against recommending that specific kinds of instruction – e.g., lab course, studio and performance courses – be generally delayed to the spring semester. In short, the committee believes the departments, in consultation with their school or college dean, are best situated to make appropriate curricular adjustments.

Would we work with faculty over the summer to enhance the quality of their offerings further or assume that faculty, having had the experience of the current semester, can do this on their own?

It is critical that the university continue to support high quality online instruction throughout the upcoming academic year. The multiple efforts by the Center for Teaching Innovation, Cornell Information Technology, eCornell and the University Library during Spring 2020 to support the overnight transition to online instruction have been ongoing since that time and continue to be refined and enhanced as new resources become available and our collective understanding of effective online teaching deepens. The ongoing development of that support, which is intended to assist both faculty new to online instruction and those who are already experienced, are set forth in the report of the subcommittee on Effective Online Delivery.

Would we pay faculty for the extra work of converting their classes to online format over the summer?

The committee does not recommend any general policy of providing extra compensation to faculty who may need to work during the summer months to prepare for offering online instruction in the fall. The committee fully recognizes the substantial burden such preparation entails and the fact that it may compete with other commitments and obligations. Nonetheless, the committee views course preparation as a permanent, ongoing and core obligation of all faculty members rather than an effort

that requires extra compensation should it fall outside specific time frames. Moreover, the committee notes many members of the university community, whether they were faculty, staff or students, made and continue to make enormous, uncompensated sacrifices of their time and energy to sustain the university's mission in the face of this unprecedented challenge. In light of this collective effort, identifying a specific group – faculty preparing to teach in the fall – for extra compensation would be anomalous. Finally, the committee is cognizant of the severe budget challenges facing the university and is concerned that providing extra compensation to a select group of faculty might compel painful offsetting cost reductions in other key areas.

The committee's conclusion, however, is not intended to limit the discretion to make appropriate compensation adjustments in individual circumstances. It also does not cover the salary issues regarding graduate TAs or others that have specifically defined and limited instructional obligations.

Would we temporarily eliminate large classes? (There has been some discussion that very large classes are especially ineffective in the current online format)

The information to date does not support the blanket elimination of large courses, or of any other general mode of instruction. Rather, the goal should be to educate and support faculty in adopting the specific teaching approaches that have proven most successful in specific kinds of teaching. CTI continues actively to collect and disseminate such approaches.

Would we make spring and summer offerings more robust for 2021 and beyond?

The university should continue the ongoing efforts to support and enhance online teaching for as long as such instruction occurs. In addition, even after a full return to in-person instruction, schools and colleges should explore maintaining particularly successful online efforts through eCornell.

What are the ADA issues we'd need to address?

As always, whether a course is taught in person or online, course materials should be accessible to all students. Online education presents some additional challenges, but existing and new resources should provide sufficient support for faculty. Student Disability Services works closely with faculty to support students who may need specific accommodations in the fall (e.g., support to complete classwork or additional time for examinations). In addition, for online instruction, the university now offers an array of services to support faculty. The Center for Teaching Innovation provides both consultation services and specific tools (captioning video recordings, providing alternative text for images, and more) to facilitate accessibility in an online learning environment. The university will shortly introduce additional resources such as Ally, a platform that enables instructors to quickly discover any accessibility issues. Further, the library can help identify teaching materials that are already fully accessible and, in many cases, the judicious choice of such materials greatly alleviates accessibility issues.

How would we handle technology issues? What have we learned from the current experience? For example: what do we do about students who are in very different time zones? What do we do about students who do not have reliable access to wifi? What do we do about students in China who may have VPN issues? What other issues have arisen or might arise?

The report of the subcommittee on Effective Online Delivery addresses technology issues.

What would we offer to students outside of their online classes? Would there be any attempt at virtual co-curricular offerings? Would we continue to provide telehealth services? And if so, how would this be factored in tuition and fees? (If the students are not on campus, it seems unlikely that they will be willing to pay fees, but if they're not paying fees we can't provide things like health services.)

The report of the subcommittee on Student Experience addresses enhancements to the student experience beyond course instruction.

What other changes would we implement, e.g., any changes to grading policies?

The report of the subcommittee on Substantive Curriculum and Modes of Delivery addresses grading and assessment challenges.

Would it be feasible to have some students on campus, and others taking classes online? Would they be in the same classes?

If the university concludes that in-person instruction should resume for the fall semester, a substantial number of courses will remain online and even those courses taught in person will typically need to provide for remote instruction for students who for a variety of reasons are unable to attend class in person. Students should be informed in advance of the mode of instruction of a course – i.e. online only or in-person with remote capacity – so that they can make informed course selections.

A separate issue is related to where students who are on campus take their online classes. Given social distancing guidelines and new rules on use of facilities like libraries and common rooms, the majority of on-campus students will take part in online coursework and co-curricular activities from their dorm rooms and common spaces in dorms, and Houses. This was outside the committee's charge but is worth noting as a significant concern that needs to be addressed as the university prepares to reopen.

What are the financial implications? This should include a consideration of whether tuition levels should be changed. The committee concluded that a full analysis of the financial implications of an online semester was beyond the expertise of the committee.

Appendix B: Discussion of Options Around Lab and Studio Courses

The Substantive Curriculum and Modes of Delivery subcommittee discussed extensive issues around labs and similar courses that are normally very dependent on in-person modalities. This appendix provides additional comments and discussion related to Recommendation 11 in the main report.

While this section focuses on lab, studio, field and performance courses, the issues are similar for other courses where in-person instruction is critically required to meet the learning outcomes. The principles below, if not the specific details, may serve as guidelines for evaluation of alternatives in such courses.

Lab learning outcomes: There are a wide range of learning outcomes associated with labs. While the specific outcomes vary, they often fall into one of four categories:
- Support and reinforcement of content from discipline courses (many times integrated within other courses but also standalone)
- Development of skills using, and/or gaining familiarity with, discipline specific physical hardware and procedures (e.g. organic synthesis, musical instruments, mechanical tests, design)
- Development of data analysis, presentation, and/or communication skills
- Development of teamwork skills

Within any given discipline, some of these learning outcomes may be achieve effectively through online alternatives but achieving all will often be challenging. For example, within engineering and physical sciences, hands-on experience with realistic hardware is critical for student development and may have no parallel through simulation or demonstrations (e.g. look and feel of electrical connectors, physical scale of testing hardware, debugging of experimental problems).

Lab environment challenges: De-densifying the lab environment poses additional challenges compared to lecture environments.
- Capacity limits: Ensuring social distancing within labs will depend critically on the nature of the physical spaces. In many cases, the unique nature of the lab spaces result in less total utilization in normal semesters, and thus replicating lab sections if viable in a hybrid (partially in person) modality. However, for labs that require occupancy reduction to 20% of normal capacity or are already fully scheduled, other alternatives will be necessary.
- Social distancing limits: Many labs traditionally have much closer (and pedagogically critical) interactions between students in lab groups (e.g. safety, teamwork). Social distancing may be extremely difficult and enhanced PPE mitigation of risks may be required. In some performance-based labs, even this will be difficult (e.g. choral groups).

Mitigation strategies: There will be no single solution applicable across the range of lab experiences in either a fully online or hybrid teaching model in the fall. Unique challenges will require a variety of solutions tailored to the structure and outcomes of each type course. However, there were some takeaways from spring offerings and ideas that have been offered for the fall.
- Defer labs, and courses with integrated labs, to spring
  - There is no certainty that spring social distancing requirements will be any less restrictive than fall requirements
  - Delaying to spring or beyond likely will cause more problems than it solves as they are often prerequisites, are linked to courses that must be offered, and in labs offered each semester the schedule will be unlikely able to manage the capacity in the spring alone

- For upper level labs, may be a necessary option but must be considered within the context of ensuring no delay in graduation (defer sophomore labs to junior year)
- Conversion to online only labs
  - Viable for many of the computer-based labs with support from tools such as AWS Apps on Demand
  - Viable where learning outcomes do not require physical access to specialized hardware (especially when focused on other learning outcomes such as data analysis or teamwork development)
  - Likely viable in the large introductory chemistry, physics, and biology courses given adequate financial support for supplies and staff time
  - Long term, as computer-based virtual and augmented reality become common, more labs could move from physical regimes to online; however, this will require development of new course materials (few current examples, and hardware limitations prohibit broad application of those – e.g. Michigan's virtual human dissection).
- Virtual labs through instructor video demonstration and/or remote operation
  - Viable in many cases, with reduced achievement of the learning outcomes
  - Significant concerns over student engagement and learning outcomes associated with hardware familiarity, debugging, experimental design
  - Can be integrated into future course offerings as background and/or instructional videos
- Development of distributable "home kits" for remote labs
  - In cases where hardware or materials are readily available, labs may be managed by students in their own spaces with instructional staff support. Examples from the spring (successful) include an ECE project lab using distributed Arduino and Raspberry Pi kits
  - Cost, support and equity are concerns. There may be wide disparities in student environment, expertise, and support that impacts learning outcome achievement
  - Potential liability concerns depending on nature of labs (e.g. chemical synthesis)
- Deployment of technical solutions to address remote-delivery limitations
  - Remote control hardware for specialized instruments in labs (microscopes)
  - In performance arts, suggestions of access to low-latency software/hardware, scholarships for individual instruction in remote location, shipping instruments/supplies; also requires training on technology for performers with staff support
- Shifted emphasis of labs (learning outcomes) within the curriculum
  - Focus on other learning outcomes: data analysis, communications/presentation skills, teamwork (cf. studio/performance solutions)
  - Increased emphasis on secondary teaching goals (e.g. history/theory/culture or pedagogy/methods courses); emphasis on virtual concerts and performances and/or solo performance modalities

Staffing needs: Discussion of online labs must all address the discipline specific staff with unique expertise that are critical to success of student learning. Concerns for staff include:
- Retention of staff while online to ensure restart of labs when we return to in-person instruction
- New roles for staff: one-on-one or small group guidance in lab techniques for students at home to replicate "instantaneous feedback" of in-person labs
- Scaling up of resources for multiple sections … staffing and supporting TA lines

Managing Course Interruptions: Like lecture/discussion courses, both hybrid and fully online lab offering in the fall will require robust strategies for addressing both instructor and student absence for limited or extended times. In many cases, the instructor challenge is slightly less severe as there is usually redundancy in the coverage through permanent and temporary instructional staff (multiple TAs).

For labs, the greater challenge is addressing (i) students who are not residential in a hybrid instructional model and (ii) students incapacitated for extended time periods for quarantine or illness. Unlike lecture courses where materials would naturally exist in a remote delivery format (video recording of lectures), the discussion above mostly imagines some level of direct interaction for physical lab experiences. There are only limited solutions to both of these cases.

- Non-residential students: This will need to be a course and department specific solution. In some cases, this may involve modification of curriculum requirements (when the lab is not critical for licensure or pedagogical advancement). Other programs may develop alternative programs that achieve many of the same outcomes within the remote environments (alternative design experiences). In limited cases, there may be no option but to defer the lab course to a subsequent semester.
- Extended absences: As above, extended absences will also require flexibility on the part of programs. A natural division of absences may be the two-week mandatory quarantine envisioned for Covid-19 exposure; absence beyond this window could be addressed with more liberal INCOMPLETE policies for health-related concerns. However, courses should explicitly consider and plan for absences up to two weeks during any point of the semester. Solutions may range from reduced requirements (4 or 5 labs), relaxed in person requirements (analyze results from another group), make-up sessions, to individualized tutoring.