

Post-Pandemic Strategic Planning: Challenges and Approaches

Report of a CNI Executive Roundtable
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Introduction

Representatives from the Coalition for Networked Information (CNI) member organizations gathered online in spring 2021 to discuss institutional post-pandemic strategies and planning. Three convenings of Executive Roundtable discussions, each with different participants, took place as part of CNI's Spring 2021 Virtual Membership Meeting. Higher education members represented institutions from across the United States and Canada, including public and private colleges and universities of varying sizes (from small, private, liberal arts colleges to large, public, research universities). Foundations, arts and library organizations, and funding entities also took part in the discussions. Senior library administrators, chief information and research officers, and faculty deans, among others, joined the conversations.

It is important to note that institutions are approaching the 2021-22 academic year from wide-ranging points of departure. Some institutions never shut down or they closed only briefly at the beginning of the crisis; teaching and learning at other schools have been almost entirely remote since spring 2020 and many institutions have operated somewhere between the two extremes. Institutions have taken a great variety of approaches in terms of testing for and managing COVID infections. In our conversations with member institutions, we noticed that there is a strong bias to generalize from local experience to assumptions about patterns in higher education broadly and we'd caution against doing so. The national picture is complex and diverse.

In the US, there is a broad assumption that students and faculty will be back on campus in fall 2021 and that the vast majority of the campus community will be vaccinated; many institutions are currently trying to navigate the challenges of *requiring* vaccinations for students and perhaps faculty and staff. A vaccine requirement is politically tricky (and has already been prohibited by law in some states), and it is perhaps legally uncertain as well since the vaccines are currently authorized under a Food and Drug Administration (FDA) emergency use authorization (EUA), rather than having undergone the more standard approval process. Institutions are also tracking many potential wildcards: vaccination rates and projections (which also implicate vaccine hesitancy), COVID-19 virus variants that may reduce vaccine effectiveness, the possible need for additional vaccine boosters in the fall, overall infection rates and state and county public health directives, enrollment rates and student preferences and expectations about in-person vs. remote instruction, limitations on occupancy of classroom and other spaces, and many more. There is a great deal of uncertainty in the planning for the fall, almost certainly a bit more than US higher education institutions are projecting in many of their current public pronouncements.

The situation in the US is different from Canada, where vaccine rollout has been slower, though, as with the US, there are enormous regional differences within Canada. Very broadly speaking, it seems that in-person reopening in Canada will lag about a semester behind the US, with very substantial remote instruction still taking place in Canadian institutions in fall 2021. While several Canadian member institutions participated in the discussions, we feel we have a more in-depth understanding of the US situation.

Despite having endured a very bad year, there is a certain sense of restrained optimism. The pandemic and the response to it have brought forward opportunities historically viewed as impossible, or, at best, far in the future, particularly in areas related to instruction. Many participants in the roundtables were eager to engage these opportunities. Furthermore, the crisis highlighted just how communications-challenged organizations had been. Students, faculty and staff have demanded clear, timely information and organizations have been under enormous pressure to deliver. There will likely be an expectation that newly established channels remain open, if not further expanded.

Budget uncertainties were an important factor in the discussions. Some organizations were already experiencing financial stress which had led to institution-wide cuts prior to the pandemic; many faced additional decreases of one sort or another once the crisis hit. We heard reports of general institution-wide budget reductions from about 5% to upwards of 30% over the course of three years. Funding fluctuations were also reported at department and unit levels; here again, figures and impact vary widely. Several libraries reported cuts to personnel and operating costs, but not to collections. Some reported stable budgets; a number reported near-term surpluses during the past year of closures, but are unclear what the future holds. Uncertainty reigns. We do not feel we have a clear picture of the budgetary landscape; part of this depends on enrollments for 2021-22 and, particularly for public institutions, another part depends on federal recovery legislation and state legislative decisions. At the same time, we did not come away with the sense that budgetary constraints and cuts were *the* primary driving force shaping planning for 2021-22 and beyond.

With this backdrop of challenges and uncertainties, participants shared how their experiences of the past year are informing their planning for the months ahead. These roundtables organically focused largely on instruction (and particularly undergraduate instruction) and campus operations, and less on the research enterprise. This may itself offer some insight into current institutional priorities.

Since April 2020, research has been slowly but systematically reopening, though with many limitations: face-to-face fieldwork and lab occupancy levels are constrained, for example. We will likely see slow and steady progress in this area; CNI has been tracking developments related to the research enterprise specifically since spring 2020 and plans to revisit the question of research continuity, reopening and resilience in June 2021 with a series of additional roundtables focusing on those issues.

Instruction in the Fall

Though most US higher education institutions are planning for a predominantly in-person fall 2021 term, details remain to be seen, and will likely vary widely. Many reported that their institutions expect to require masks, some said their administrations are considering foregoing social distancing measures (to the extent that local and state governments give them the flexibility to do so); at the roundtables, none said that they are planning to require vaccinations, though we note a month later, as of late-April 2021, the *Chronicle of Higher Education* lists well over 100 higher education institutions that will require students or employees to be vaccinated against COVID-19 (see <https://www.chronicle.com/blogs/live-coronavirus-updates/heres-a-list-of-colleges-that-will-require-students-to-be-vaccinated-against-covid-19> for a regularly updated list), so we may have just been a bit too early in posing the question, and this indicates how rapidly the public health situation on the ground is changing. Some of these requirements (such as those announced by the University of California and the California State University) will be contingent on at least one vaccine transitioning from EUA to full approval by the US FDA. There is an additional problem that wasn't discussed in our convenings but is clearly emerging quickly, and which goes far beyond higher education: reliable documentation of vaccination status, particularly in light of recent polling that suggests that those who do *not* plan to be vaccinated are widely planning to acquire counterfeit documentation of vaccination. Somehow vaccine documentation will need to be connected to campus student, faculty and staff personnel systems.

The taxonomic inconsistencies in how to describe some of the available instructional modalities are notable; they proved to be a significant source of confusion in some of our discussions. There have been various forms of instruction throughout the pandemic: in-person, remote (online), or some combination of the two. Even prior to the pandemic, many faculty had moved to so-called "flipped" classes, where the lectures were recorded, streamed and available for replay on-demand and perhaps in person as well; primary in-class time was used for discussion. During the pandemic, a few schools made extensive and expensive commitments to what is most often called the *hyflex* model, which involves equipping classrooms with (expensive) technology that allow both in-person and online students to participate in a class simultaneously; many of the schools pursuing this path learned that additional in-class staffing to support the faculty was also needed to make this mode work effectively. The key idea with hyflex instruction is that students should be able to decide, session by session, whether to attend in person or remotely. This accommodates students who are sick or quarantining, for example, as well as those who are not physically able to be on campus for whatever reason.

Most schools indicated that there would be some kind of mixed offerings available in fall 2021 and beyond, but there seems to be general consensus among faculty and students that the hyflex model, where a mix of remote and in-person students participating in the same class simultaneously, has been a disaster. Nonetheless, it appears that a few schools at least are determined to stick with it. Many faculty are now saying they'd rather teach two courses, one online and one in person, though they'd ideally like to be paid for the double work. Or they will teach in-person and make personalized accommodations for students that must be physically absent from substantial numbers of classes.

Hybrid models, which, as indicated, were already taking hold prior to the pandemic, offer more encouraging results. In a hybrid course, mixed modalities may be incorporated into the overall course plan by the faculty, but everyone would be *either* remote *or* in-person when participating in any given class or section. For example, lectures may be online for all, but some discussion sections could be held entirely in-person, while others could be held entirely online, provided that *all participants* in any given class or section are *either* online *or* in-person.

It's clear that most institutions are going to have to offer some level of online instruction for 2021-22 and perhaps beyond; what is much less clear is the level of ongoing commitment to providing all-online courses as part or all of a degree program. For 2020-21 the expectation for campuses that had reopened in person was that students should be able to attend essentially all classes *either* remotely *or* in person, and this seems a stretch for 2021-22. Also uncertain is the extent to which there will be clear differentiations between online and in-person instructional options, and to what degree students will be required to choose between them as they select their courses.

Finally, two important broad observations. There is a good deal of at least anecdotal evidence that early-career students (freshman and sophomores) have had a lot more difficulty with entirely online or remote instruction, and it appears at least some institutions will target these populations (particularly those who had a remote freshman year) for (possibly small) in-person classes in 2021-22 as a priority.

Also, the events of the past year, preceded by the discussions of "flipping" classes in the past few years, have genuinely opened the door to much broader faculty and departmentally-lead, course-by-course considerations of what makes sense online and what makes sense in person, what needs to be synchronous and what can be asynchronous. This could be the beginnings of a major rethinking and rejuvenation of undergraduate (and perhaps some graduate) instruction at our universities over the next few years. It will be a process rather than a sudden change.

Other issues discussed related to instruction:

- To what extent will institutions accommodate remote students? If schools are assuming students will be back in person, will there be online versions of courses for those who want them? Many state schools already have extensive online programs. Will students simply be directed to online programs if they cannot or will not return in person? Some roundtable participants told us that this is, indeed, the plan at their institution. Other (notably some private) schools are clear that their fundamental identity is as a residential, face-to-face institution, and that the pandemic accommodations are temporary and unwelcome. A key question here: what is the cutoff point for supporting remote users when a program is designed to be in-person? Decisions may vary for graduate and undergraduate programs, and among institutions that enroll many international students. Some institutions will recommend that students who can't attend in person defer their admission for a year, perhaps. Requirements and logistics for vaccination may also factor into these decisions.

- Most campuses are hedging about large lecture courses, which represent a small percentage of actual courses but a significant number of student hours. Social distancing and classroom density are key issues here (as well as fear of so-called “super-spreader” events) and some institutions are exploring the option of making these lectures entirely remote, with in-person discussion and problem sections. At least a few participants suggested that we may finally be seeing the twilight of very large lecture courses and that we may see repurposing of most very large lecture theater facilities (see below). Institutions are increasingly questioning the value of students attending lectures with many hundreds of participants in person; for those not in the first few rows, these lectures may be better online, even discounting the convenience of being able to view and review them on demand rather than only synchronously.
- Colleges and universities are assuming that foreign students will continue to experience difficulties gaining access to North American institutions, such as problems securing visas (delays, national security concerns, etc.) or pandemic-related international travel bans. Here, again, is the question of where to draw the line for programs designed to be in-person. The issues are nuanced: depending upon a student’s course of study, schools might be able to offer a full year online until a student can arrive on campus. There are major revenue considerations here for some schools, which count on tuition from foreign students for a significant portion of their budgets. (Note that this is a very significant issue for universities outside the US as well, indeed perhaps even more significant than in the US.) There is also a complex mix of issues, some of which are primarily relevant to undergraduate programs and others that are driven by doctoral and post-doctoral level research work. It’s important to separate these.
- At the graduate and advanced research levels, there is evidence emerging of more cross-institutional collaboration. Topical departmental colloquia and graduate seminars are drawing participants from all over the country now, if not the world, no longer restricted to the immediate geographical area. Similarly, faculty can make much more use of guest speakers now because the barriers are lower. Some of this is also being reflected in the changing nature of academic conferences that have been moved online. In some sense, the most difficult problem now is accommodating time zones. These developments are not being well tracked or documented other than with occasional anecdotes, many of them very discipline-specific, but we suspect that they are going to be very significant in the next few years. CNI will be following developments in these areas closely.

Spaces

In the very near term, decisions on some campuses will be driven by county or state public health officials, but institutions are clearly looking beyond that.

Many campus spaces may be significantly altered in the post-pandemic era, and density issues will influence decisions about space planning, particularly in the near term. Ventilation has emerged as a significant engineering issue. We heard a lot about how organizations are trying to best prepare for possible scenarios involving teaching, learning, and working. With respect to academic spaces, some organizations are

assessing their existing inventory of classrooms and the various types of learning spaces that already exist on campus, and they are exploring opportunities to plan spaces more strategically, in ways that support the broader institutional mission. Participants reported focusing on flexible options with respect to room size and configuration, furniture, and access to technologies (especially those that support active learning). As for the office space environment, here again, institutional policies regarding workforce remain to be announced at most institutions, and these will shape options and needs. The thinking here, generally, seems to be that, in the future, staff spaces will be designed for roles and teams, and that they will have stronger shared-space characteristics.

Other factors are likely to influence how space is used or adapted but may be difficult to assess in advance: How will people feel upon returning to in-person environments, and how might their concerns about health and safety impact the way they use available spaces? Will we see a resurgence of demand for relatively small-group collaboration spaces? Will people be comfortable using spaces where large numbers typically gather in close proximity (e.g., the learning commons), or will they gravitate toward larger spaces in order to socially distance? The temptation to revert to old usage patterns may be strong, even when there is a general consensus (perhaps even a policy) about a preferred new practice. How will organizations help guide communities toward post-pandemic procedures and encourage them to adopt those practices, and what should these be? Note here also the differences between student behavior, which is largely driven by personal preferences, and staff behavior, which will be significantly shaped by institutional policies that may be at odds with individual staff preferences.

Beyond reconfiguring spaces for students and faculty, there are also much more complex, long-term strategy questions about the allocation of central campus space for organizations like libraries and information technology or research support. This is tightly coupled to decisions about off-campus workforce issues discussed below. These extremely political campus issues are tied to the ways in which the costs of central campus spaces are distributed and accounted for, and the ways in which public and workforce spaces are allocated and delineated in organizations such as libraries and other academic support functions. Campus organizations will need to track these developments closely and ensure they have a seat at the table as decisions are made.

A few other issues related to physical campus spaces:

- There will be considerable rethinking about space usage in general: for who and for what purpose? If large lecture classes, for example, typically held in large halls, go online, what will happen to the now-empty halls? Remodeling, reallocating and repurposing spaces are costly and lengthy endeavors; it is unclear if anyone is systematically budgeting for these projects, but they will be significant factors. We suspect that discussions surrounding the allocation of funds for remodeling and repurposing, as opposed to those for new construction, may be among the most contentious in the coming years.
- The attempt to adopt hyflex instruction models has raised the awareness of the enormous classroom technical debt facing many institutions. Few campuses had many classrooms that could plausibly attempt to host hyflex classes at the

beginning of the pandemic; a few institutions spent many millions of dollars upgrading large numbers of classrooms for hyflex on an emergency basis. A long-overdue broader discussion of priorities and objectives for upgrading classroom space is emerging as a result of the pandemic experience and the broader reconsideration of instructional modalities we've already discussed.

- Campuses (and particularly libraries) have deployed space occupancy and space reservation systems during the pandemic, particularly for study spaces. These have often been well received and there is a genuine question about how much of this infrastructure should be retained after the pandemic.
- As we consider resilience issues, particularly in response to airborne respiratory pandemics, there are clearly concerns that tall, densely occupied vertical buildings serviced by elevators represent a point of vulnerability. How important will this be going forward? Will these concerns change campus space planning strategies?
- For many years, there have been observations about the inefficiency of physical plant utilization by our research universities, both in terms of the semester or quarter systems, summer vacations, and the like, but also in the finer resolution of limited utilization hours during the academic year. We may be seeing a much greater push to optimize this utilization, particularly if it is driven by occupancy/density limitations and social distancing requirements, and some institutions are at least tracking this possibility closely. Budget pressures may provide an additional impetus for change here, perhaps particularly at state institutions.

Workforce

Budgetary pressures have led to widespread hiring freezes. These have been combined with staff attrition and an increased number of retirements in response to the demands on people during the pandemic in addition to early retirement incentive programs offered by some institutions to mitigate the impact of the COVID-19 pandemic. High staff vacancy rates have been burdensome and they have emphasized the mismatches between staffing and needs in some areas. Administrators are rightfully concerned about widespread staff burnout. In organizations where positions can be filled, managers are considering how best to prioritize new hires in light of needs, opportunities and evolving plans, and also considering the pragmatics of onboarding new staff during the pandemic. At the roundtables, organizational leaders discussed at length their concerns with providing staff with adequate support. Morale has suffered greatly under the wide-ranging emotional tolls of the past year, in addition to the anxiety people are feeling about future issues such as budget cuts. Major transitions and great uncertainty lie ahead, and everyone is exhausted. Organizations are tired and stressed; there needs to be time for healing and rebuilding social capital as we begin to reassemble and return to more normal operations. Of particular note is the impact of organizations that have onboarded new employees in the virtual environment, particularly at leadership levels, and the need to create or re-establish social capital in those contexts.

A major and unclear factor is the extent to which employees will have the option to work from home once in-person operations fully resume. Many organizations that did not systematically permit remote work previously are now considering or adapting to it. Beyond possibilities, there is the question of employee preferences, which are not well understood. Apart from serving as an attractive option for some employees, allowing staff to work remotely can serve as a recruitment advantage for organizations located where the cost of living is high, for example, or in areas where it may be difficult to find candidates with certain specialized skills. This also creates important opportunities for institutions pursuing diversification of their workforces, since it can open a potential national candidate pool.

A good taxonomy for remote work does not exist, and it's important to differentiate models when thinking about and discussing options and policies. For example, some employees are considered remote when they live locally and work from home some days but work on campus other days. Another remote work model is when an employee lives wherever he or she wants, possibly far from the workplace, and seldom, if ever, is physically on-site; an in-person visit likely means getting on airplanes. In our discussions at the roundtables, we found these two scenarios were frequently confused and conflated.

Other related issues:

- Events and reality have outrun policy at most places: organizations are operating based on temporary authorization policies or practices that emerged out of necessity. Human resource (HR) units have been slow to establish and publicize clear policies regarding remote work and related issues.
- A conversation is underway about shared offices and “hoteling,” which relates to decisions about remote work.
- There was repeated mention of the serious equity implications surrounding remote work options, and how, typically, the lowest-paid front-line employees have the least amount of flexibility, and the lowest-paid staff shouldered most of the in-person burden throughout the pandemic. There is a strong desire to think through these issues carefully. It is not clear whether there is a viable or sensible solution to this problem, however, other than perhaps an argument for flattening salary disparities or banning remote work.
- As the portfolio of services and activities changes, there is an increasing mismatch between existing staff and organizational needs; reskilling and upskilling issues are receiving considerable attention. The nature of professional development is changing. Remote and more affordable events have allowed more staff to get training they might not have had access to before. The move to online offerings may allow for broader access to training, upskilling, and re-skilling, but the online modality presumes that people already have a relatively high level of technological literacy, which could introduce other equity issues.
- Union involvement at some institutions further complicates the ability to reassign activities. Similarly, tenure (library faculty status) may be an issue that can also limit the flexibility to reorganize.
- Many organizations have not had to manage remote workers in the past; thought must be given to how to develop and deploy those skills in managers and

supervisors now attempting to manage and lead partially or completely remote teams.

- Many commented on the increased communications burdens, both within organizations and across campuses, particularly in the current highly politicized environment that some public institutions are navigating.
- There was increasing recognition that the 9:00am-5:00pm, Monday-Friday schedule, that was so convenient for many staff members, is increasingly unresponsive to the needs of students and faculty and needs to be abandoned, particularly in light of shifting expectations and perhaps larger numbers of remote users that may be coming from a range of time zones.
- There are a large number of extraneous but very important issues about remote work that will influence institutional choices. At public institutions, shifting to large numbers of out-of-area or out-of-state employees may be a major issue (and, notably, a political one). This will be particularly relevant in “college towns” where the university anchors a key part of the local economy. Unions are always a question. International employees can create enormous complexities, and (perhaps justifiability) make most institutional HR departments extremely wary. Many institutions are only comfortable dealing with employees in a limited number of other states due to various tax and related arrangements. There are also some broader issues that the pandemic has brought into intensive focus, such as which states have tax claims over an individual’s income under various employment and work arrangements.

Library Services

Because of the heavy representation of library leadership in these conversations, we include here some discussion of issues that are specific to libraries, as opposed to other academic units such as IT organizations.

Most library-affiliated participants acknowledged that the pandemic afforded academic libraries a unique opportunity to demonstrate and showcase their capabilities and offerings, and, as a result, campus (particularly senior leadership) perception about what the library can do and what it can deliver is shifting in a positive way. Many participants said that building on the renewed and revitalized perception of the value of academic libraries is critical, particularly when promoted in alignment with the community’s needs in areas such as digital rights, affordability, accessibility, and emerging technologies, to name a few.

Libraries that prioritized digital collections (including course reserves) before the shutdown were better positioned to cope with the demands of the crisis. Unsurprisingly, the events of the past year have helped to accelerate the transition to prioritizing digital collections, and have bolstered arguments for such policies. Several participants remarked on efforts to secure practices that changed during the pandemic, and they also mentioned data-gathering efforts to demonstrate the prudence of continued support for policies like digital-first collecting practices. In March 2020, as part of CNI’s spring 2020 membership meeting, we held a series of online Executive Roundtables on a related theme, *New Strategies for Acquiring Learning Materials*; a report of those

conversations is available at <https://www.cni.org/go/new-strategies-for-acquiring-learning-materials>.

With increased focus and emphasis on electronic materials, we learned that print collection acquisitions funding at many institutions declined more rapidly during the pandemic, with resource funding at many institutions shifting to electronic resources. To cope with constrained access to physical collections, many libraries made use of controlled digital lending (CDL) practices through HathiTrust's Emergency Temporary Access Service (ETAS), allowing member libraries to obtain access to digital editions of print books held by their library, or they adopted CDL practices with their own collections, digitizing print materials as needed and lending secured digital versions to one user at a time (in place of the physical item). The result has been vastly increased access to digital materials, and libraries anticipate a demand to keep these new services; sustaining some of those amenities has wide-ranging, complex implications, including possibly facing legal challenges about CDL. It's very clear that there will be important decisions about the ETAS strategy and CDL positions in the coming years at many of our member libraries. These will be connected with, but not driven by, pandemic developments – in fact, they may become more difficult if and when the pandemic recedes.

There is also a problem that is being largely ignored (or at least undiscussed) around user experience. ETAS and CDL more broadly typically work with scanned images; these are cumbersome and unpleasant to deal with, particularly on mobile devices. Other than the very real and vital speed and convenience of access, they are generally inferior to the physical book, though of course far better than no access for the motivated reader. Most readers are conditioned to much more pleasant (often consumer) e-book experiences that involve born-digital PDFs or (even better) fully reflowable EPUB formats. These also provide huge accessibility improvements for materials. There's clearly a need for a much more nuanced discussion about the costs, feasibility, and priority of moving past scanned images for many kinds of materials in the post-COVID environment.

Several library services that came about during the pandemic will likely continue across institutions, including self-check-out, lockers, virtual reference and research assistance service, asynchronous instruction, seating reservation systems, and express paging.

We are seeing growing and continued pressure to invest from collections budgets to support the large-scale acquisition of instructional materials for courses, as well as steadily growing interest in open educational resources (OER).

A particular nightmare for research libraries throughout the past year has been facilitating access to commercially-licensed audio and video media for instructional use, and particularly materials in the consumer marketplace. Part of the problem involved technical delivery infrastructure for streaming video, particularly with students in remote locations that may have limited bandwidth. But by far the greater challenge seems to have been licensing of material for streaming, which, historically, had been available for physical in-class viewing or local access via DVD through the library. In some cases, the costs of accessing course materials had to be pushed off to individual students because the library was unable to license from vendors like Apple, Amazon or

Netflix. In other cases, libraries had to purchase extremely expensive network streaming licenses from companies like Kanopy. The experience here has highlighted urgent public policy problems that will need to be addressed. We believe it's important to fully document these and include them in public policy discussions going forward. But in the near term, libraries will have to make decisions about what (often costly) streaming arrangements to retain, and when to revert to pre-pandemic practices.

Other issues that came up related to library services included:

- More asynchronous instruction is being offered by libraries, partially in response to enormously increased demand, especially with regard to research needs, such as data management and data science. This trend is very much counter to pre-pandemic practice, which emphasized small, in-person, "high touch" workshops, and it remains to be seen how this balance will be set post-pandemic.
- Experience in the pandemic underscored the inability of municipal or regional reciprocal borrowing agreements, interlibrary loan, and other resource-sharing agreements to sensibly extend to online environments. These rely heavily on the doctrine of first sale, and hence the interchange of physical objects. This is a problem that the research library community broadly needs to reflect upon and develop strategies to attempt to address.
- There is an important discussion emerging about the importance of prioritizing resources for remote access to archives and special collections (see the spring 2021 CNI plenary session, *Remote Access to Archives and Special Collections and the Sourcery Project*, "<https://www.cni.org/mm/spring-2021/plenary-sessions-s21/remote-access-to-archives-and-sourcery> for an introduction to the key issues here), though this topic wasn't explored in depth in the roundtables.

Other Important Issues

Many other issues were discussed. Here we try to summarize some of what we thought were the most important.

- Residential broadband for working from home and for students learning remotely is a critical issue; the current situation is a national disgrace. This is not entirely under the control of higher education, but the community has been increasingly involved, and it has to be a priority, even if what we can do directly is limited. The situation has been aggravated when other community centers offering connectivity (e.g., public libraries) have closed. We know people are using Wi-Fi at fast-food restaurants; we heard about faculty having to mail thumb drives to students living in Wi-Fi and cellular deserts. Many campuses with large commuter populations have made deliberate efforts to provide good Wi-Fi coverage in areas such as parking lots. EDUCAUSE and Internet2 are actively advocating for these issues in the legislative sphere, and there are developments that need to be closely tracked here. It will be essential to continue these efforts. At a more technical level, Internet2 has led very successful and crucial major national efforts to re-balance backbone peering efforts with various

broadband providers that primarily service residential consumers. The changes in traffic flows are staggering; this is a great success story.

- Open science, open access, and specific practices such as the use of preprints have gotten a big boost during this time, which will likely persist. This is particularly interesting because the pandemic implicates areas such as virology, epidemiology and public health that have been particularly reluctant to engage various aspects of open science and open access. There are difficult issues here waiting to be fully engaged, notably appropriate practices for mass-marketing journalistic reporting on un-refereed preprints.
- At many institutions, the move to remote instruction has been used as a justification to shift to centrally-licensed and supported tools and services for instructional technology. A very good case study here would be online/remote proctoring services, which are an unusually invasive, unethical, dysfunctional and problematic group of platforms; many institutions have centralized their procurement and support, and some institutions have essentially banned them. We need to gain much more understanding about these developments, and CNI may take a closer look at proctoring services specifically in the coming months. But the overall pandemic drive to more consistent, centralized campus services is unquestionable.
- There has been an enormous scaling up of teaching and learning support services, and many institutions have increased investment in teaching and learning centers and consulting services. Faculty expertise in instructional technology has received increased attention. To the extent that these trends continue, they will be very helpful.
- Video management, especially involving recorded classes, has turned into a big, expensive problem that is seldom being managed comprehensively. This is both a technical/financial and a policy problem that CNI hopes to examine in a September 2021 Executive Roundtable. Internet2 hosted a recent online presentation on this topic, "Managing Video Content Retention Using Panopto," on March 17, 2021 (a video is available at <https://internet2.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=5b0428b3-3173-4095-8564-acef00e6eae>) that provides some helpful and provocative data.
- How important will it be to maintain instructional resilience and capability to operate remotely in case we have to return to it quickly? Some liberal arts colleges especially will need to think through this question. The same question exists with respect to research resilience, but the details for instruction and research differ extensively. One might formulate some of the issues here in terms of risk management and insurance investments.
- Digital public health and welfare have been growing areas that have included contact tracing, infection monitoring, vaccine distribution, and links to county and state data. There is increasing interest in student well-being and mental health, which is likely to experience considerable investment. This may reshape IT investments on many campuses, which historically has not dealt much with management of this kind of data, or the deployment of systems to integrate it.
- The need to meet the demands of public health and continued operations in the pandemic environment led to the adoption of new tools or practices, like remote proctoring, or the rapid deployment and adoption of digital public health

records, for example. Many of these new developments have led to significant privacy loss, which now seems to have been normalized. Organizations need to think of what compromises have been made and which ones they are willing to continue making. Several roundtable members emphasized the importance of leading their institutions into a process that systematically revisits decisions that had been made hastily, pragmatically and quickly under emergency conditions. Put another way, the needs of the emergency have outrun careful policymaking; this imbalance needs to be redressed rather than establishing a new baseline by default.

- Graduate students and postdoctoral researchers are particularly vulnerable to this crisis and its aftermath. Many are caregivers, and/or they are in precarious economic situations; organizations are thinking about how best to support them, and how to improve their safety net. This is also closely related to the ongoing health of the research enterprise and we'll further explore this in our June Executive Roundtable.
- Several participants observed that decision-making processes at their institutions have changed, with big, slow, conventional consensus planning being abandoned in favor of a culture informed by much greater agility and a sense of urgency.

Concluding Reflections

Many new and highly productive collaborations were born from the urgent need to support campus communities, including reinvigorated partnerships between IT, the library, and offices of research. Faculty were also a critical part of these alliances. These partnerships advanced the integration of learning materials into learning platforms, strengthened the research infrastructure, and facilitated the ongoing maintenance and management of community health data and services, among other things. Connections beyond the academy also developed; relationships emerged or strengthened between higher education institutions and local governments and communities, public libraries, arts organizations, and K-12 schools – this seems to have been particularly significant outside of major metropolitan areas. The role of consortia also evolved during this time, helping institutions leverage resources jointly to meet their communities' pressing needs. We heard from many participants that the past year has helped to break down barriers and silos, and there is a strong desire to maintain these new connections. Many participants conveyed the notion that nurturing and expanding inter- and intra-institutional collaborations will be an important cornerstone of post-pandemic recovery.

It is worth bearing in mind the stunning and sobering observation made by one participant that, when in-person operations do resume, a quarter of undergraduate students will have had no experience of the academic library as a place, or as a source of services or expertise – they may never have encountered a major research library. Libraries need to think extremely carefully about the implications here for when students finally return to campus. More broadly, institutions need to consider that in some sense they are facing two cohorts of entering “freshmen” who are encountering the campus experience for the first time in fall 2021 – half of the undergraduate population. This has enormous implications.

It is perhaps appropriate to conclude with an observation that addresses society as a whole, not simply higher education (though it is very relevant to higher education).

We may see a gradual, then more rapid return to what life was like before, somewhat similar to the aftermath of the 1918 Spanish Flu pandemic, where we do our best to forget and suppress what happened and resume the pre-pandemic trajectory. A lot of people died during the pandemic, but the world didn't fundamentally change. This event seems to have had minimal effect on the national psyche or developmental trajectory. Some participants thought this scenario likely.

A few participants also made a compelling alternative case that, considering the scale of government spending, the restructuring of the labor force, the emergence of new technologies, and the enormous death toll, the pandemic of 2020-21 and the complex of related political, social, and economic events represent a socio-technical change on the scale of World War II, and that massive social and political changes are in the offering. This demands extremely careful consideration.

We found it striking that both of these future scenarios were specifically identified and framed in the Executive Roundtables this spring.

CNI Executive Roundtables bring together groups of campus partners, usually senior library administrators along with research and information technology leaders, to discuss key digital information issues and their strategic implications. The Roundtables build on the theme of collaboration that is at CNI's foundation, serving as a forum for frank, unattributed intra- and inter-institutional dialog. In addition to fostering community connections, CNI Roundtable discussions serve as a valuable resource for informing its ongoing program planning process.

The Coalition for Networked Information (CNI) is a joint program of the Association of Research Libraries (ARL) and EDUCAUSE that promotes the use of information technology to advance scholarship and education. Over 200 institutions representing higher education, publishing, information technology, scholarly and professional organizations, foundations, libraries and library organizations, make up CNI's members. Learn more at cni.org.