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Results of a Summer 2020 Survey of Computer Science Academic Units / Chairs: The Impact of COVID-19 So Far and Planning for the Fall

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Introduction

This report describes the results of a survey that was conducted by CRA between June 29 and July 13, 2020 with the goal of gaining perspective on the experiences, challenges, and lessons learned by departments across North America during the COVID-19 pandemic. Specifically, the survey questions address the impact of the COVID-19 pandemic as of July 2020 on faculty, budgets, and departmental operations, and best guesses about the upcoming fall. The responses provide a mid-summer snapshot of a rapidly changing situation.

The move to online teaching and meetings in March was difficult and stressful, and the uncertainty surrounding the fall is equally so. Academic units are balancing the needs of students and faculty, education and research, amid deep concerns about budgets and the physical and mental health of students and colleagues. For chairs, having to make decisions with insufficient information and changing guidelines increases the stress level.

The pandemic is ongoing and there are no final answers here. The concluding section identifies key areas that we believe chairs should monitor and questions for further data collection.

Methods

The survey, which we call a “chairs” survey, was conducted at the academic unit level (department or college/school). In some academic units, the response was spread among those

with responsibility for different areas, e.g., budget or graduate and undergraduate enrollment, as well as the chair / head / dean.

This chairs survey parallels a similar survey of faculty conducted in late June 2020, thus several sections in this white paper compare faculty perceptions to chair perceptions. However, the faculty survey was fully anonymous and therefore we cannot be sure how the academic unit affiliations of respondents to the faculty survey compare to the academic units who completed the chairs survey.

An invitation to complete this survey was sent to academic units on the CRA Taulbee list (U.S. and Canadian units with doctoral programs in computer science, computer engineering, and information science/information systems) and non-doctoral computing units with a CRA connection (CRA members or participants in the CRA CERP Data Buddies surveys). Some of the academic units are departments, and others are schools or colleges of computing or information.

The survey was completed by 127 units:

- 61 US CS public doctoral units (44% of US CS public)
- 25 US CS private doctoral units (48% of US CS private)
- 2 US CE doctoral units (6% of US CE doctoral)
- 12 US Information Systems/Science doctoral units (55% of IS doctoral)
- 7 Canadian doctoral units (24% of Canadian doctoral)
- 20 US non-doctoral units (23% of invited non-doctoral)

Among the 100 US doctoral responses, 46% were small (<35 tenured, tenure-track, and full-time teaching faculty) and 54% were large (>=35 faculty). Table 1 summarizes the information on degrees and online programs at the responding units.

Table 1. Existing online programs and degrees granted in responding institutions.			
	Percent within column		
	US Doctoral (N=100)	Canadian (N=7)	US Nondoc (N=20)
Percent of institutions that already have online programs			
Bachelors	12.0	28.6	15.0
Masters	43.0	28.6	15.0
Grad certificates	24.0	28.6	15.0
Selected Courses	39.0	57.1	30.0
Percent of institutions that grant degrees at each level			
Bachelors	97.0	100.0	100.0
Masters	100.0	100.0	30.0
PhD	100.0	100.0	0.0

The survey questions can be found here: <https://cra.org/wp-content/uploads/2020/07/Academic-Unit-Survey-Questions.pdf>

The spreadsheet at this link contains data behind the figures and tables in this document and tables with additional details for some topics: <https://cra.org/wp-content/uploads/2020/07/Chairs-Survey-Spreadsheet.xlsx>

The white paper for the parallel faculty survey is here: <https://cra.org/wp-content/uploads/2020/07/Faculty-Survey.pdf>

Moving Online in Spring 2020

Time to Move Online

Among the responding departments, 66% had 1-2 weeks notice of moving instruction online, 16% had less time, and 18% had more.

Overall Challenge of Moving Instruction Online

The chairs were asked “Considering your department as a whole, to what extent do you agree with this statement: My department found the shift to online teaching to be a significant challenge.”

This is similar to a question asked in the faculty survey. Faculty were asked to identify a specific course that moved online in the spring and then, among other things, asked how much they agreed with the statement that “Shifting to online teaching of this course was difficult and stressful.” Although the questions are not quite the same, we wanted to compare the faculty and the chairs’ perspectives. Figure 1 makes these comparisons. Faculty, especially faculty at non-doctoral institutions, were more likely to agree that the shift was challenging and to feel strongly about it (Non-doctoral faculty 86.8% Agree or Strongly Agree, Doctoral faculty 62.5%). Chairs were in accord across unit types, with 59.0% of Doctoral chairs and 57.9% of Non-doctoral chairs responding Agree or Strongly Agree. Non-doctoral chairs, on the other hand, were most likely to *disagree* that the shift was a significant challenge (26.3%).

Shift to Online Teaching Was a Significant Challenge

Source: CRA COVID-19 Surveys of Academic Units and Faculty, June-July 2020

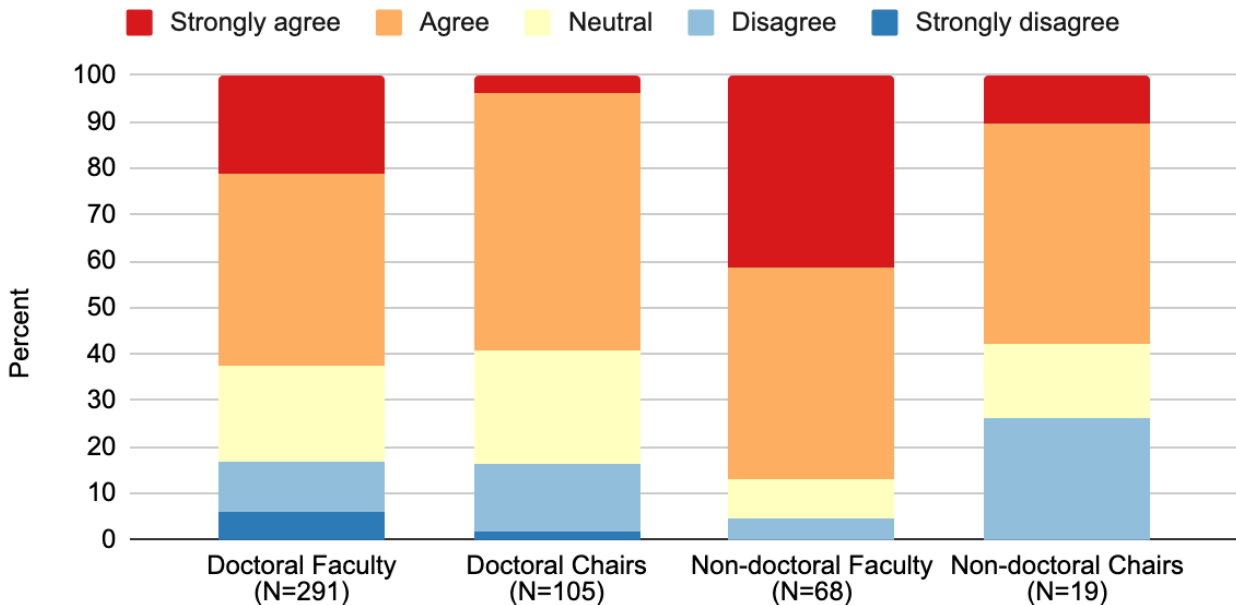


Figure 1. Shift to Online Teaching Was a Significant Challenge: Faculty vs. Chairs.

Resources

The chairs survey asked what resources were provided for switching to online instruction, with options of Not Provided, Provided by Department, Provided by Institution, and Not Provided but Would Have Been Useful. Hardware was most likely to be provided by the department but most other resources were likely to have been provided by the institution, if provided at all. Table 2 summarizes the chair responses. The resources question was also asked in the faculty survey. The rightmost column in Table 2 is taken from the faculty survey and shows the percent of faculty responding “Not provided, would have been useful.”

Figure 2 compares the chair and faculty responses for “Not provided, would have been useful,” which may highlight places additional support would be especially helpful if teaching is online again in the fall. Faculty and chairs were in agreement that resources for scalable exams were the most needed resource. Faculty were more likely to say that training in online pedagogy would be useful (23%), while chairs were less likely to identify this as a need (11%) but still saw it as the second-highest additional need.

	Percents From Academic Unit Survey (N=126)				Percents From Faculty Survey (N=392)
	Not provided	Provided by department	Provided by institution	Not provided, would have been useful	Not provided, would have been useful
Scalable exams	19.4	15.3	31.5	33.9	26.1
Training in online pedagogy	12.9	7.3	68.5	11.3	23.3
Training in online technology	5.6	14.3	75.4	4.8	7.4
Access to support staff	0.8	28.0	66.4	4.8	12.4
Hardware	10.4	52.0	33.6	4.0	10.7
Online teaching tools	3.2	11.9	82.5	2.4	5.1

Resources Provided to Faculty for Online Shift in Spring

Source: CRA COVID-19 Surveys of Academic Units and Faculty, June-July 2020

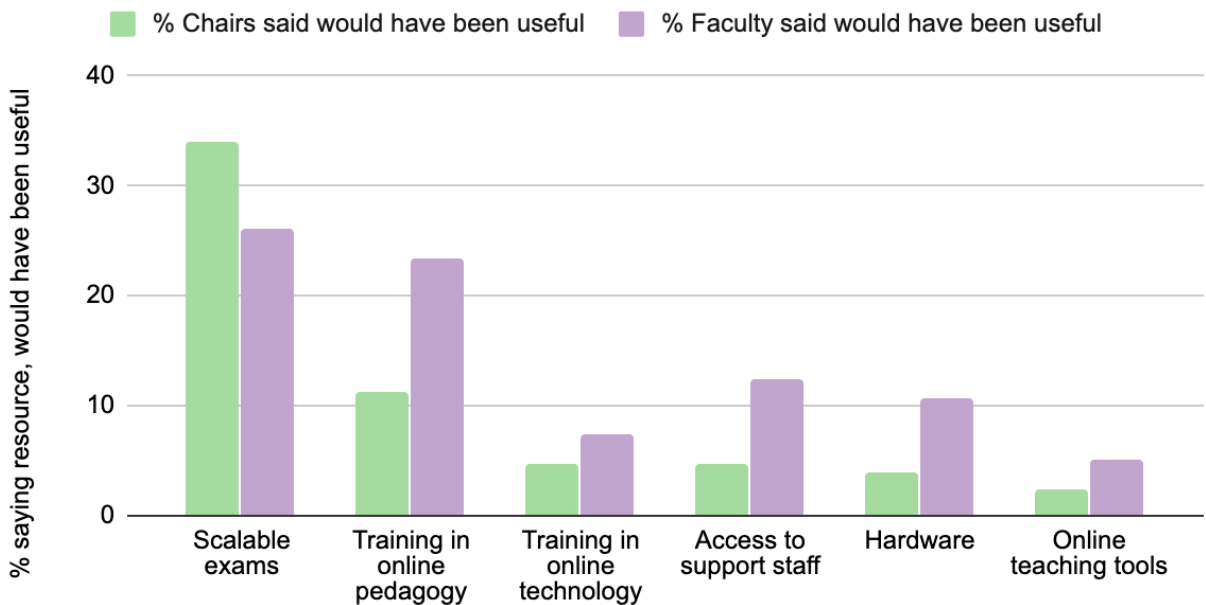


Figure 2. Resources Provided to Faculty for Online Shift in Spring: Not provided, would have been useful.

Impact on Support for Students From Underrepresented Groups

The mid-semester disruption impacted students in different ways. For members of underrepresented and other vulnerable groups in computing, the lack of supportive campus activities was a concern for many units. The survey responses indicate that 40% of the responding chairs felt there was significantly less/ somewhat less support in the virtual environment, as shown in Table 3. As diversity and inclusion are a priority of our field, support of activities and programs targeted at underrepresented groups in computing should be re-evaluated in the fall, especially as units will have a better understanding on what is effective in a virtual format.

	Percent (N=125)
Easier to support in some respects	2.4
About the same level of support as usual	37.6
Somewhat less support than usual	29.6
Significantly less support than usual	10.4
Not sure	16.0
Not applicable	0.8
Other	3.2

Experience of Faculty and Staff So Far

Impact of the Pandemic on Work of Faculty

Figure 3 reports the chairs' perceptions of the impact of the pandemic on the work of their faculty (asked based on academic ranks). Chairs believe that the pandemic has had the most negative impact on the work of pre-tenure tenure-track faculty (16.8% significantly negative, 79.8% significantly or somewhat negative). Tenured faculty were judged as least impacted, although "least impacted" is still a negative impact on 64% of both associate and full professors.

Impact of the pandemic on the work of each faculty rank

Source: CRA COVID-19 Academic Unit Survey July 2020

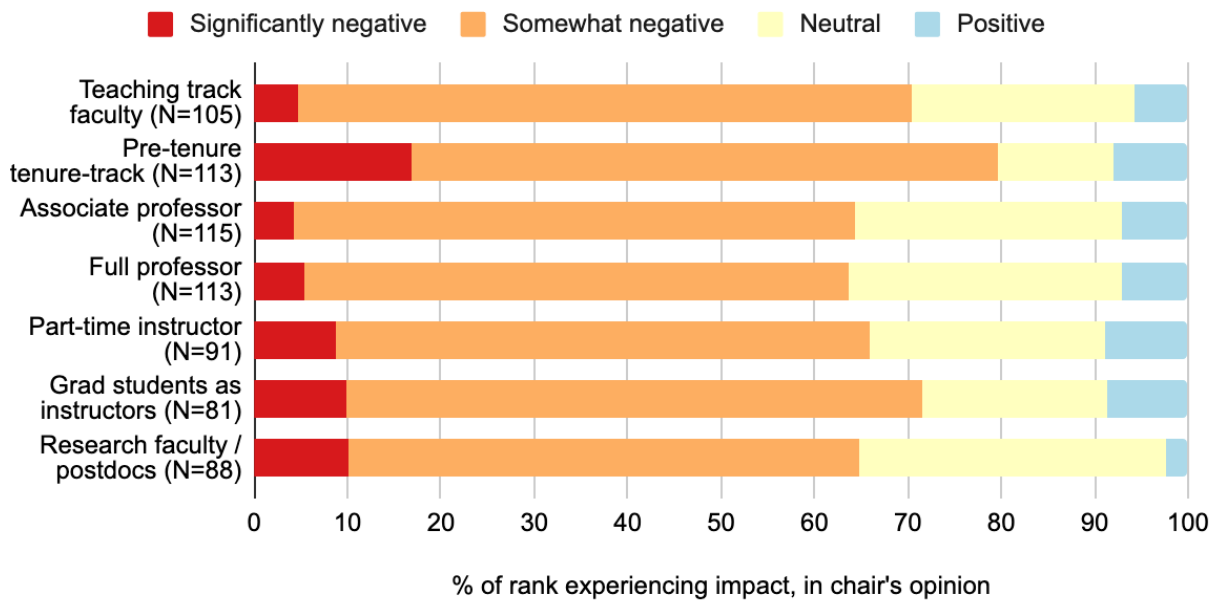


Figure 3. Impact of pandemic on the work of each faculty rank.

The survey asked about challenges to junior faculty in particular (the survey did not differentiate between tenure-track and teaching faculty). Figure 4 summarizes the chairs' responses. The top three challenges to junior faculty are

- Uncertainty related to graduate research assistants (RAs) arriving in the fall. The majority are international students whose status is particularly uncertain (58.4% a major challenge, 89.1% somewhat a challenge or major challenge)
- Lack of child care (86.2% somewhat or major)
- Travel constraints (85.6% somewhat or major)

Some of the non-doctoral units in the survey are masters-granting, but most do not have graduate students. Setting aside the challenges related to graduate students, which many chairs marked as Don't Know/Not Applicable, the top challenges for non-doctoral junior faculty were viewed as:

- Balancing teaching and research (88.3% somewhat a challenge or major challenge)
- Travel constraints (87.5% somewhat or major)
- Lack of child care (83.4% somewhat or major)

Challenges to Junior Faculty

Source: CRA COVID-19 Academic Unit Survey July 2020

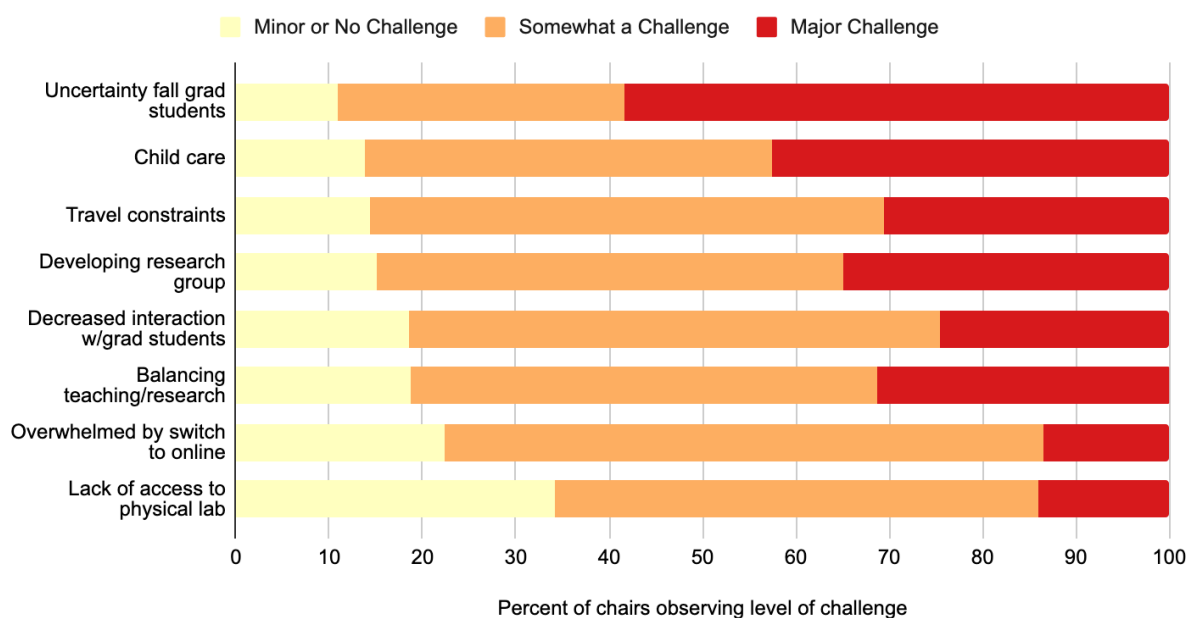


Figure 4. Challenges to Junior Faculty.

Many institutions were quick in recognizing the impact of COVID-19 on the tenure clock and introduced a 1-year extension. In most institutions, the extension is automatic. 81.5% of the responding units report a 1-year extension of the tenure clock and such a policy is under discussion or available by request at other institutions. No change to the tenure clock has yet been made at 8.4% of institutions.

It is unclear whether the impact of the disruption and delay of building a research group and attracting graduate students will correspond to a 1-year loss for junior faculty. Responses indicate that faculty with child care responsibilities experience a more significant loss of time. Units should re-evaluate the situation of their junior faculty during the coming year and provide needed mentoring.

Modes of Communication After Moving Online

Almost all departments (95%) reported moving to virtual faculty meetings. Also, 78% have additional virtual meetings, 58% have virtual drop-in meetings for concerned faculty, and 69% make more use than before the pandemic of channels such as email or Slack. Only 39% of chairs report virtual meetings with junior faculty.

Impact on Staff of Moving Online

Department staff take care of many tasks vital to the smooth functioning of their units. During the disruption in the spring, staff needed to support the move online for faculty and students while simultaneously moving their own activities online. In general, departments reported that staff adjusted well (84% somewhat or very much) and continued to provide the same level of support as in usual times (82%), although the move was stressful (62%). Many had childcare or family issues (78%) and a smaller number had hardware/internet problems (54%) and it was necessary to adapt or postpone some usual staff tasks (68%).

Faculty Hiring

One can expect that many units had ongoing faculty hiring that was disrupted in March. Two-thirds of the doctoral units that responded to the 2019 CRA Taulbee Survey planned to hire tenure-track faculty for the following year with an aggregate increase of 6.2% of total tenured and tenure-track faculty, and 45% planned to hire non-tenure-track teaching faculty, either teaching professors or other instructors. In this context, it is not surprising that 77% of the academic units responding to the COVID-19 survey continued hiring after activities went online.

Breaking down the units that did not continue hiring shows 25% of US Public, 14% of US Private, 14% of Canadian, and 33% of US Non-doctoral (percentages are of units responding to the survey). We note that some of the units that did not continue hiring had already made offers and had them accepted before the pandemic.

Of the units that continued hiring

- 80% did so with no change in hiring areas or seniority
- 93% felt virtual interviews were effective or partially effective

With respect to offers, 47.2% of the units that continued hiring made offers as planned. Units reported changes in the offer-making process that included:

- more approvals required (26%)
- more difficulties than usual in solving dual career situations (24%)
- making fewer offers (18.1%)
- fewer or no simultaneous offers (11.8%)
- “other” difficulties (12%), many of which were immigration or visa-related
- shorter deadlines on offers (7.9%)

Ninety academic units reported the number of tenure-track positions they tried to fill during the 2019-2020 academic year, and 58 reported the number of teaching track positions they tried to fill. Of those, 12.5% of the tenure-track and 15.2% of the teaching-track positions were reported as unfilled due to COVID-19. We did not ask for details, but from other sections of the survey we conjecture that many of these were due to hiring freezes. We did not ask about anticipated hiring over the next academic year (and many of the chairs would not know the status at the time of completing the survey).

Budget

By early July, the impact of the pandemic on university budgets had already received considerable attention. Academic units were clearly concerned about their budgets and the uncertainties ahead. The survey asked 17 budget-related questions with response options Has Happened/ Under Discussion/ Possible/ Not Expected/ NA. Figure 5 shows the responses.

Looking at all units reporting, the top “Has Happened” and “Not Expected” responses are:

Top “Has Happened”

1. Freeze on staff raises (69.2%)
2. Travel restrictions on departmental funds (67.5%)
3. Freeze on faculty raises (65.5%)
4. Change in department / faculty purchasing policies (47.5%)
5. Reduced departmental operating budget by a fixed percent (39.3%)

Top “Not Expected”

1. Reduced renewal of teaching faculty contracts (68.9%)
2. Reduced retirement contributions (56.8%)
3. Salary reductions (55.1%)
4. Reduced graduate TA support (53.8%)
5. Staff layoffs or furloughs in department (53%)
6. Reduced undergraduate TA support (51.3%)

COVID-19 Budget Actions

Source: CRA COVID-19 Academic Unit Survey July 2020

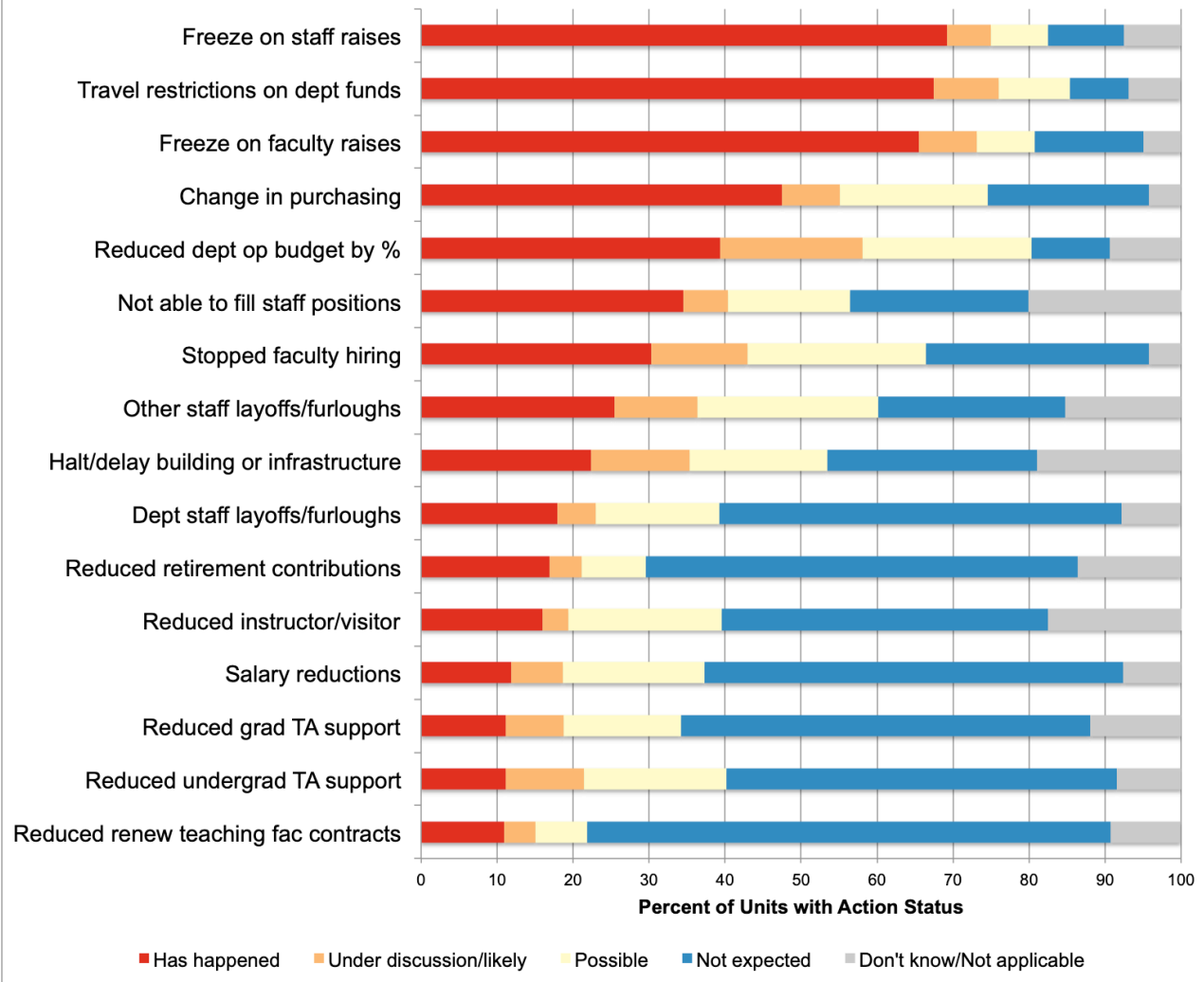


Figure 5. COVID-19 Budget Actions, All Responding Units.

The responses on budget actions that have already happened differ between US Doctoral Public and Private. Figure 6 shows that private institutions are much more likely than public ones to have already taken actions on six budget items (difference given in parenthesis):

- reduced retirement contribution (by 44.1%)
- restrict travel with departmental funds (by 13.6%)
- freeze faculty raises (by 18.9%)
- freeze staff raises (by 16%)
- change purchasing policies (by 19.1%)
- furlough/layoff of staff not in the department (by 11.2%)

Budget Actions Happened: US Doctoral Public vs. Private

Source: CRA COVID-19 Academic Unit Survey July 2020

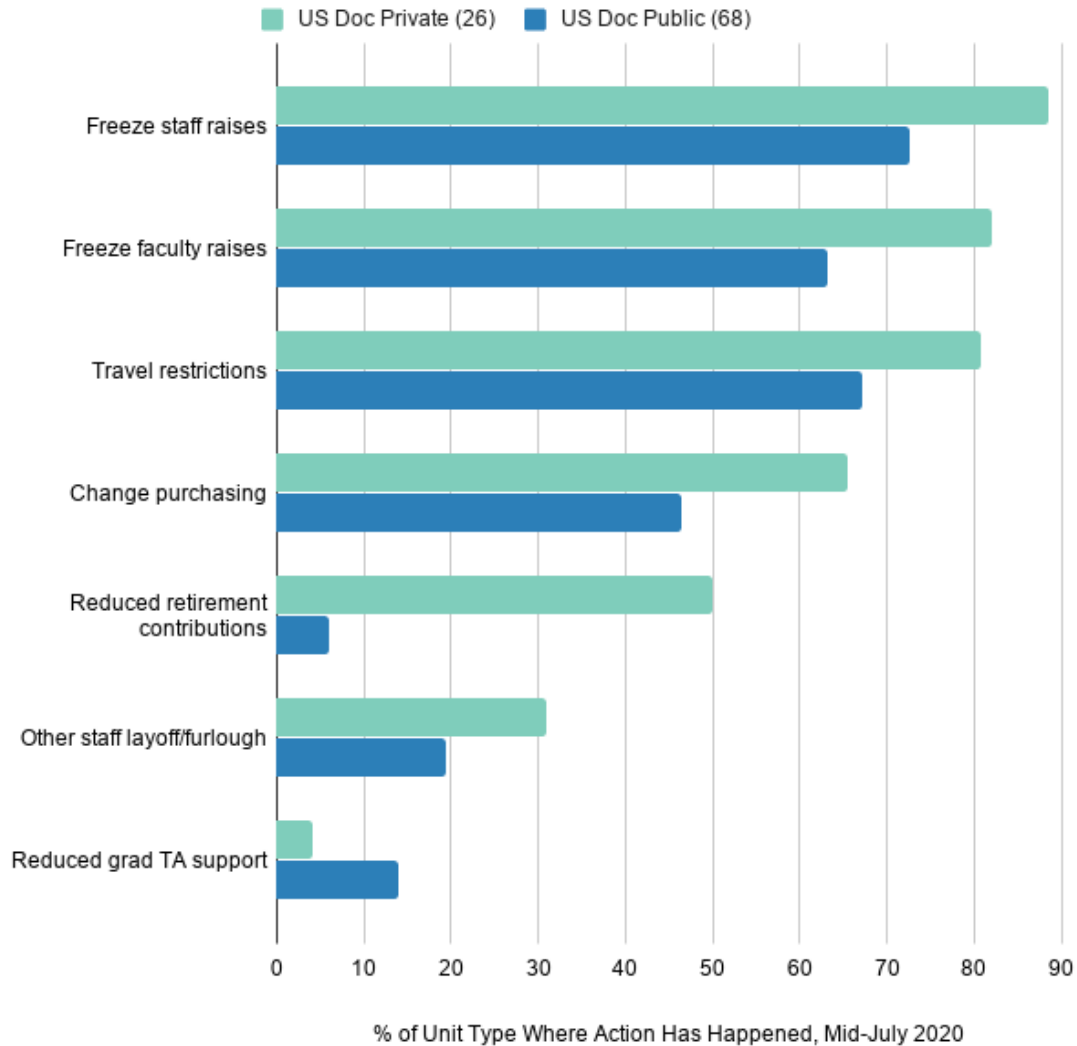


Figure 6. Selected Budget Action Comparison of US Doctoral Public vs. Private as of mid-July.

Units are unsure about continued industry support with 34% indicating that decreased industry support was possible; 37% said don't know / not applicable. Only 9% said industry funding was not expected to be reduced.

Generally, the non-doctoral units were similar to the doctoral units in budget actions, with the exception of being more likely to have already experienced a staff layoff or furlough in the department (28% non-doctoral vs. 18% overall) or elsewhere in the institution (44% non-doctoral vs. 25% overall). Some of the items are less likely to apply to non-doctorals, leading to increased ratings of "don't know/not applicable" for items such as reduced grad TA support.

End of Year and Summer Activities and Status

End of Year Events

The responses to the questions on end of year activities indicate that units explored various ways to honor graduating students and recognize achievements. One can expect that units gained an understanding of what worked and was well-received. Such insight should be helpful in the coming academic year as events are likely to remain at reduced in-person level. Table 4 shows how units handled end of year events.

	Percent of column saying some events handled this way		
	US doctoral	Canadian	US non-doctoral
Postponed	50.0	14.3	70.0
Virtual live	64.0	57.1	70.0
Virtual recorded	82.0	71.4	65.0
Canceled	38.0	14.3	30.0
Other	6.0	0.0	0.0

The virtual approaches used to honor students and recognize achievements include recorded messages made by faculty, recorded messages made by students, and social media posts. 14% of the responding units have delayed honors and recognitions.

Student Job Search

The survey asked Doctoral institutions: To what extent are your new PhDs having trouble finding a job? New PhDs seeking academic jobs were judged more likely to be experiencing a significant problem than those seeking industry positions, but the chairs' answers suggest that only 18.7% of new PhDs experienced a significant problem finding an academic job. Table 5 shows the complete responses.

	Not a problem or minor	Somewhat a problem	Significant problem
Overall (N=84)	53.6	36.9	9.5
Industry (N=80)	52.5	38.8	8.8
Academia (N=75)	50.7	30.7	18.7

In the parallel faculty survey, 42 faculty members reported that they had PhD students graduate this spring or summer. For those students, they reported the following academic job search challenges related to COVID:

- Offer rescinded (2)
- Shorter deadline due to COVID (3)
- Increased difficulty in resolving a dual career situation (4)
- Other COVID related job search challenges (visa or paperwork issues, interviews rescinded/delayed, chaotic interview process, rushed process due to potential hiring freeze) (13)
- Delayed graduation (9)

Faculty were only aware of three new PhDs who applied to the CRA CI Fellows 2020 program. This small number is not surprising given that most of the graduating students from the responding faculty had successfully found jobs.

Doctoral institutions were asked in the Chairs survey whether they were aware of PhD students deferring their defense due to pandemic-related inability to finish as planned or due to concern about the job market. 42% were aware of a small number of graduating PhDs doing so, and 3% were aware of more than a few students. This is a number of chairs rather than a number of students, so doesn't give a clear picture of the extent to which students are deferring completion, but it does suggest monitoring the situation.

All institutions were asked about the job situation for new graduates at each degree level. At the PhD level, the responses are similar but not identical to those in Table 5: 39% of departments in Figure 7 said the situation was worse than usual for PhD students compared to 46% in Table 5 who said that job search was somewhat or a significant problem. At all degree levels, but especially at the PhD level, the chairs felt it was too soon to tell about the job situation (31%).

How do you judge the job situation for your new graduates?

Source: CRA COVID-19 Academic Unit Survey July 2020

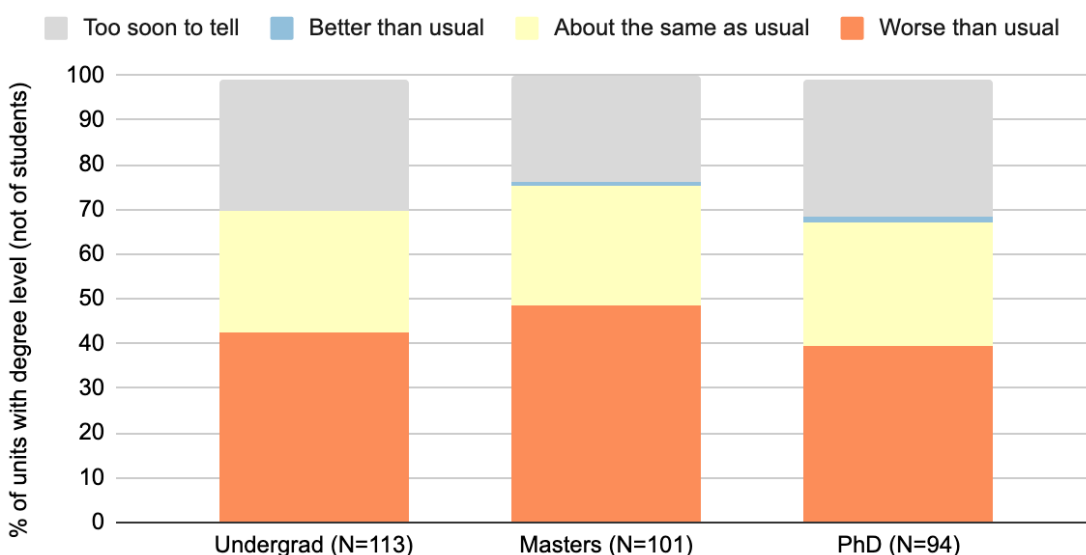


Figure 7. Job situation for new graduates.

Summer REUs

The survey asked chairs about their experience with research experiences for undergraduates (REUs), both formal and informal. "About the same as usual" is the most common response for everything except REUs at other institutions, which were being used less than usual. This could be because of travel restrictions or because REUs were canceled.

There is some support for the hypothesis that with usual summer jobs disrupted, more students are trying to get involved in research.

Some existing formal programs went virtual for the summer, e.g. CRA-WP DREU. It will be interesting to learn from their participants about their experiences, challenges, and proposed best practices for virtual REUs.

Table 6. What is your department's experience with undergraduate research this summer? (% of units)

	Faculty including UG in research informally	Students expressing interest in research	Formal REUs at your institution are operating	Students are participating in REUs at other institutions
Less than usual	31.8	10.4	34.2	58.0
About the same as usual	48.6	53.1	49.4	34.0
More than usual	19.6	36.5	16.5	8.0

Looking Forward

Faculty Sabbaticals

Faculty sabbaticals were planned for the 2020-2021 academic year at 66% of the responding institutions. Of the 83 departments where sabbaticals were planned, at 69% at least some faculty were proceeding with approved sabbaticals, at 48% some sabbaticals were canceled or deferred, and at 22% a decision was pending when the survey was completed (sums to more than 100% because departments could have had multiple sabbaticals expected and thus more than one response).

Income-generating Actions

US doctoral programs are more likely to have begun considering income-generating options; non-doctoral are least likely. Canadian programs are more likely to be considering increasing admission of first-year students. "Other" actions include seeking contract, grant, and philanthropic activities, and intensive communication with newly accepted and continuing students to encourage them to enroll. Figure 8 shows the responses for US doctoral, Canadian, and US non-doctoral.

Income-generating actions units are considering

Source: CRA COVID-19 Academic Unit Survey July 2020

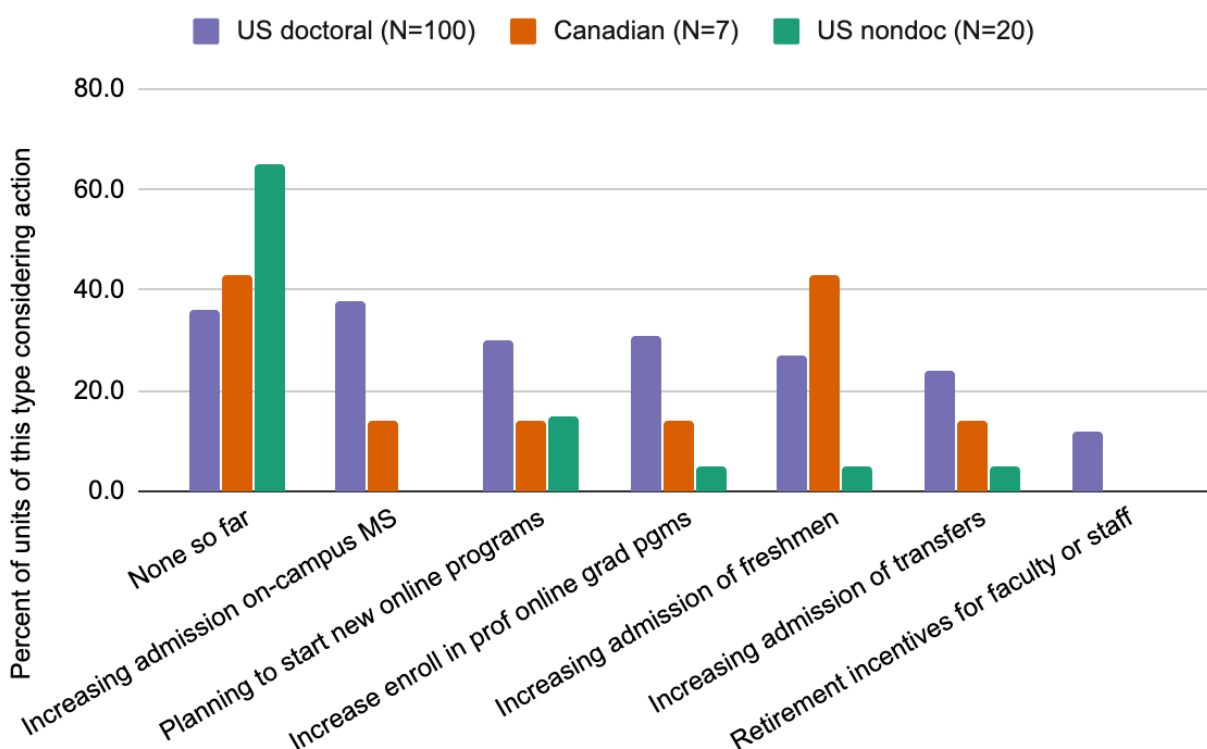


Figure 8. Income-generating actions units are considering.

Academic Hiring in 2020-2021 School Year

While many units undoubtedly had faculty hiring plans for 2020/21, there is a great deal of uncertainty about faculty hiring in the coming academic year.

- Some institutions already have hiring freezes, some expect to have hiring freezes, others are still trying to fill positions added due to enrollment growth, and some will continue hiring as planned.
- For 2020/21, the post-doc needs are closely tied to the overall hiring situation. In fall 2020, many departments may not yet know their hiring situation.
- 2020/21 is likely to be an extremely unstable and uncertain year for graduating PhDs. A number may defer their graduation.
- Pursuing a post-doc opportunity may be a highly desirable option for new PhDs.

As units finalize hiring plans with their administration throughout the fall, situations are likely to continue to change for many. Adapting to a changing landscape is recommended to all who hire faculty or are looking for an academic job.

How will courses be taught in Fall 2020?

With responses collected by mid-July 2020, the data presented are a snapshot of expectations at that time. Decisions of some institutions have already changed and the situation can be expected to continue to change.

Canadian institutions committed early to expecting all their courses to be online in the fall. The vast majority of US departments expect a mix of online, hybrid, and on-campus courses. No unit expects their courses to be all on-campus. Table 7 shows the expectations on course delivery as of the time of this survey.

	Percent of Units*			
	Total	US doctoral (N=100)	Canadian (N=7)	US nondoc (N=20)
Mix of online, hybrid, and on-campus	86.6	93.0	14.0	80.0
All high enrollment courses online	22.8	25.0	0.0	20.0
All online	16.5	10.0	86.0	25.0
Other	3.1	3.0	0.0	5.0
No idea	1.6	2.0	0.0	0.0
All on campus	0.0	0.0	0.0	0.0
All freshmen courses online	0.0	0.0	0.0	0.0

* Columns may total to more than 100% because units could select more than one answer.

Over two thirds of the respondents indicated that their institution collected feedback from faculty on how courses should run in the fall. About a quarter of the institutions had not done so by mid-July. Canadian institutions were less likely to collect feedback, but by the results in Table 7, they were already deciding to be completely online.

Among institutions planning to have on campus classes, 67% expect to offer instructors a choice of whether they want to teach online or not. It was not yet decided at 22%.

Predicting Fall Enrollment in July 2020

Not surprisingly, there is no consensus on whether in fall 2020, units will see freshmen major enrollment increase/stay the same/decrease and whether total undergraduate major enrollment will increase/stay the same/decrease. 41.7% of all reporting units expect that the number of incoming students will decrease and an equal percentage, 41.7%, expect that the number of incoming students will stay the same or increase. Only 26% expect the overall size of the undergraduate program to decrease.

There is consensus on the impact on the graduate program. For US doctoral institutions, units are concerned about

- Visas of incoming international students (97.0%)
- Visa renewals (86.0%)
- Having enough TAs due to issues with international students (61.0%)
- Seeing longer time to graduation for PhD's (60.0%)

US public and private doctoral units express similar levels of concern on these issues, except that privates are more likely to expect increased enrollment in online master's programs (32.1% vs. 15.3% of public).

Canadian units are less concerned about visa renewals. They are also less concerned about students leaving without a degree. However, they are more concerned about having enough TAs because of constraints or issues experienced by incoming international students.

Expectations and Concerns About Graduate Programs

Source: CRA COVID-19 Academic Unit Survey July 2020

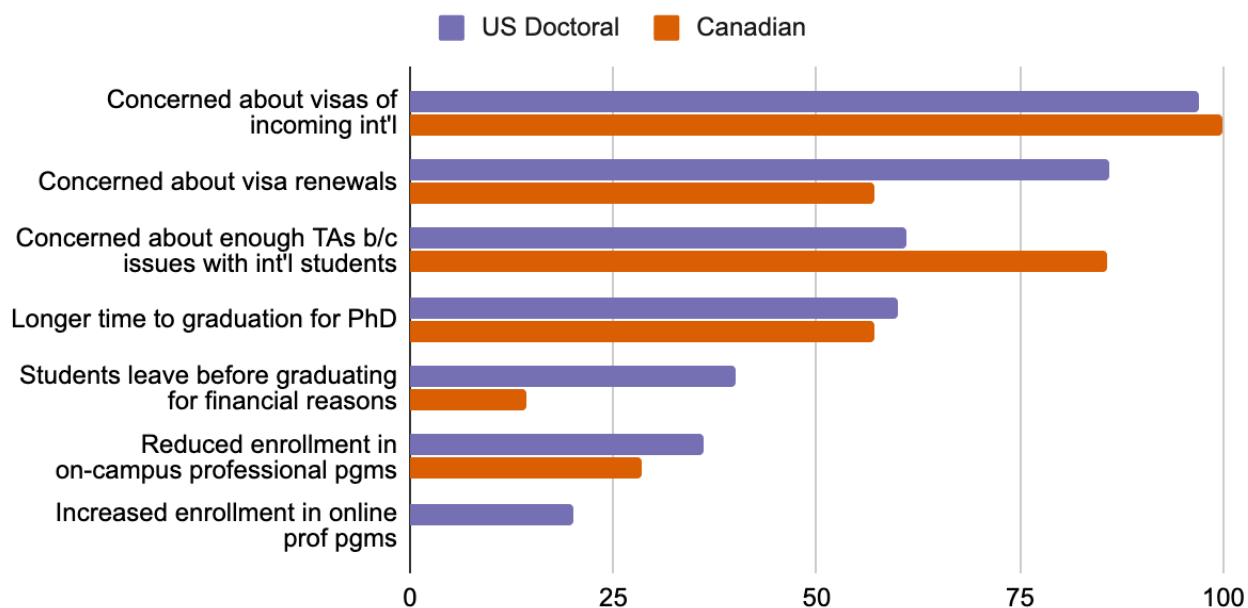


Figure 9. What do you expect to happen to students in your graduate programs?

Chairs are overwhelmed and stressed

Chairs of units never imagined having to deal with a set of challenging issues as seen today. Several survey questions focused on their experiences in the spring and the situation in early to mid-July. Of the 118 chairs responding to these questions, 55.1% have been in the position 2 or more years, 26.3% between 1 and 2 years, and for 18.6%, this was their first year as chair.

Figure 10 shows the chair's rating of their workload and stress. In the spring, 90% of chairs experienced their own workload and stress level as somewhat or significantly increased. The

greatest amount of additional time and effort was spent dealing with the dean or other university administration (85% somewhat or significantly increased).

Chair's Job Experience Spring 2020

Source: CRA COVID-19 Academic Unit Survey July 2020

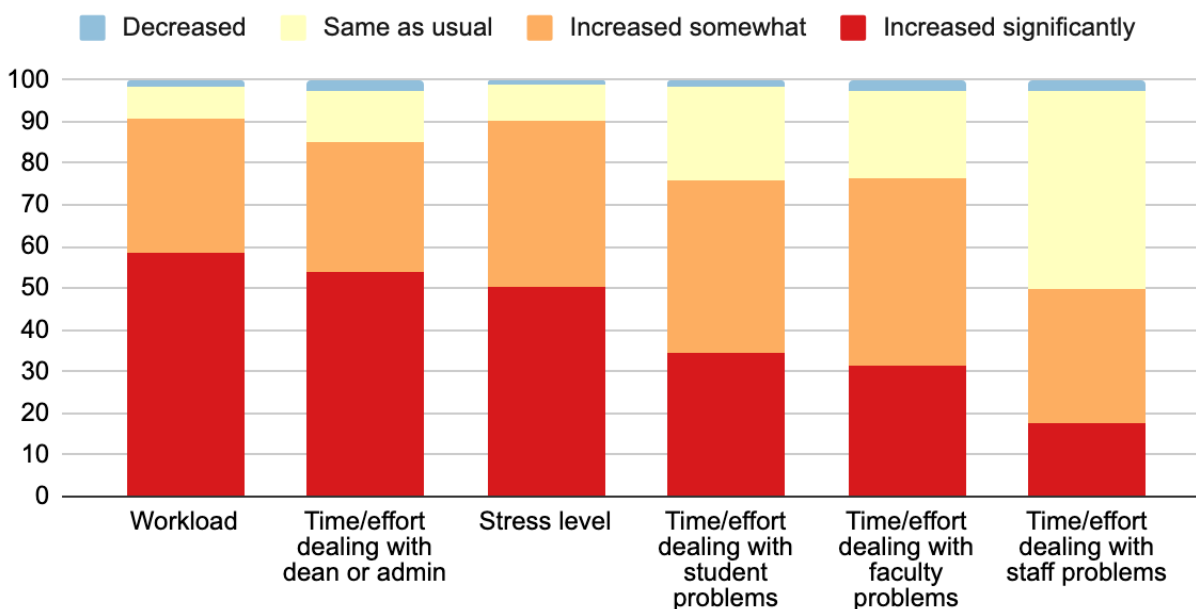


Figure 10. Chair's Job Experience Spring 2020.

When the survey was completed in July 2020, 88% of chairs said that their stress level was still somewhat or significantly increased, and 90% said their workload was somewhat or significantly increased. In short, the situation is not improving for chairs. In a text-response question at the end of the survey, asking what else was important, one chair commented that they wondered how many chairs hope to step down or retire as a result of COVID-19, and another said that the question about the job during the spring didn't ask about the level of joy/satisfaction in the job, which had decreased significantly.

As the next section discusses, there are many remaining and increasing challenges. Institutions and the computing community should consider what can be done to support chairs.

Challenges Units Face

Chairs were asked to provide text responses to the question "What do you perceive as your greatest department challenges for the upcoming academic year?"

Chairs saw many challenges, and they, of course, vary by context. Here are the main themes and the number of times they were mentioned. The top three are Resources (primarily budget), Demands of online/hybrid learning, and Uncertainty.

Table 8. Greatest challenges for the upcoming academic year.	
Theme	# of mentions
Resources: mainly budget/revenue, also TAs, space, research lab access	34
Demands of online/hybrid learning, balancing act between administrative demands, faculty preferences, and course needs	27
Uncertainty, decisions outside of department control, complexity	27
Providing good education and supporting students (e.g. maintain quality, minimize time lag in graduation rates)	21
Reduced enrollments in undergrad and grad programs: affects both revenue and program stability/ sustainability	20
Engagement / morale / experience of students	18
Engagement / morale / burnout of faculty, staff, and chair/ impact on work-life balance and child care	18
Maintaining health	16
International students: will they come, visa issues, supporting them	14
Sustaining growth, momentum, improvement	14
Faculty Hiring	14
Research productivity of faculty and grad students; constraints/threats to research (e.g. lab access, travel / conference restrictions)	13
Developing/maintaining connections, sense of community	9
Diversity and inclusion, Broadening Participation in Computing, Americans with Disabilities Act, anti-racism: continuing and increasing these efforts	8
Supporting junior faculty and mentoring new faculty, adapting promotion process	7
Conflicts with administration (COVID-related or other)	6
Keeping programs intact / avoid destruction	5

One chair's comment captured the intertwined challenges facing each academic unit and the computing community as a whole. Don Fussell, chair of the CS department at the University of Texas, Austin, said:

We have many of the same challenges as before COVID, advancing our diversity, research, teaching, hiring, and development plans. COVID makes all of these more challenging in several ways.

- *First, we have to fully develop new processes that work in our socially distanced world to achieve our goals as effectively as we could before. We've seen how challenging online teaching, meetings, and interviewing can be in the past several months, and we'll need to continue to do better at all of these.*
- *Second, we have to adjust to a new fiscal reality, at least temporarily. The university's budget, and the extent of cuts we can expect, are quite uncertain at*

the moment, making planning difficult. External financial support from industry and donors has been significantly impacted, at least in the short term.

- *Third, we have to keep everybody well, both physically and mentally, in these challenging times. This means social distancing, and it means working to make our departmental culture able to support the mental health of people, students, staff, and faculty, under severe psychological stress. This is particularly true for underrepresented groups, who have already suffered from a deficit of support in many cases.*
- *And fourth, we have to do all of this in ways that enable all of our stakeholders to be as productive as possible at their primary tasks in education and research.*

Recommendations

The results of this chairs survey suggest several recommendations for chairs and leadership in the computing community. Many of the implementations of the recommendation should be evaluated in an ongoing way to adjust to changing processes and needs.

Our recommendations include:

- **Graduate students.** Initiate actions (e.g., enhanced recruiting of US students into PhD programs, increased support for research collaboration with students at a distance, increased funding for RAs, increased Fellowships for US undergraduates entering PhD programs in CS) to address the concerns that the lack of international PhD students will impact academic careers.
- **Junior Faculty.** Collaborate with NSF through CRA/CCC to ensure support for the junior faculty pipeline (e.g., increased postdoc opportunities, additional support opportunities for junior faculty such as EAGER)). Ensure that faculty mentors are engaged and are reaching out to their mentees. Especially work to engage and support new faculty.
- **Diversity, Equity, and Inclusion.** New and unpredictable challenges fall especially on those who are already facing challenges. All students and faculty are stressed in the current situation, but those who may already be marginalized and those who are new are at greater risk of being isolated or overwhelmed. Also, faculty or students with K-12 or younger children and a lack of child care are in an unsustainable situation; traditionally and anecdotally, the impact is likely to fall disproportionately (though not exclusively) on women. Departments or the university cannot ignore the impact the current situation has on their diversity and inclusion efforts.
- **Chairs and crucial departmental leaders.** Chairs should re-assess the organizational structure as well as priorities in their unit to best manage the increasing workload without burnout. Their health is crucial. Stable leadership is crucial.
- **Communication.** Monitor all aspects of the evolving situation for continued change and long-term impacts, and provide mechanisms for rapid sharing of information and best practices among chairs. Be transparent in communication with faculty and students about issues that affect them. Establish procedures for regular communication among faculty with the same research or teaching specializations, as well as within departments. Develop and sustain ways to build community and reduce isolation for both students and faculty.

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Participating Academic Units

Canadian

McGill, Universities of British Columbia (CS), British Columbia (ECE), Manitoba, New Brunswick, Victoria, and Waterloo

US Doctoral (Computer Engineering)

North Carolina State, University of Illinois Urbana-Champaign

US Doctoral (Computer Science, Public)

Auburn, Clemson, Colorado State, Drexel, Florida International, Georgia State, Indiana University Purdue University Indianapolis, Indiana University School of Informatics and Computing, Kansas State, Michigan State, Michigan Technological, Missouri University of Science & Technology, Montana State, New Mexico State, North Carolina State, North Dakota State, Ohio State, Oklahoma State, Penn State, Purdue, Rutgers, Stony Brook SUNY, Texas A&M, Texas Tech, University at Buffalo SUNY, Universities of Alabama (Tuscaloosa), Arkansas, Arkansas at Little Rock, California (Berkeley, Riverside, San Diego, Santa Barbara), Colorado (Boulder), Delaware, Florida, Illinois (Chicago and Urbana-Champaign), Iowa, Kentucky, Maryland (Baltimore County), Massachusetts (Amherst), Michigan, Minnesota, Mississippi, Missouri (Kansas City), Nebraska (Lincoln), New Mexico, North Texas, Oklahoma, Oregon, South Florida, Texas (Arlington, Austin, Dallas, El Paso), Utah, Vermont, Virginia, Washington (CSE and Human Centered Design & Engineering), Wisconsin (Milwaukee), Virginia Commonwealth University, Virginia Tech, Wayne State.

US Doctoral (Computer Science, Private)

Boston University, Brandeis, Brown, Case Western Reserve, Columbia, Cornell University, DePaul, Emory, Illinois Institute of Technology, Johns Hopkins, Lehigh, MIT, Northeastern, Northwestern, NYU Tandon School of Engineering, Rensselaer, Toyota Technological Institute at Chicago, Tufts, Universities of Chicago, Notre Dame, and Pennsylvania, Vanderbilt University, Washington University in St. Louis, Worcester Polytechnic, Yale.

US Doctoral (Information Science, Information Systems, Informatics, IT)

Cornell, Drexel, Indiana University School of Informatics and Computing, Syracuse University, Universities of Arizona, Cincinnati, Colorado (Boulder), Illinois (Urbana Champaign), Maryland (Baltimore County and College Park), Michigan, Texas (Austin), and Washington.

US Non-Doctoral

Baldwin Wallace University, Barnard College, Boston College, Bowling Green, Carleton, Grinnell College, Hiram, Illinois Wesleyan, Kean, Mount Holyoke, Northern Kentucky, Pomona, Swarthmore, Union College, Universities of Hawaii (Hilo), Illinois (Springfield), North Carolina (Greensboro), and Northern Iowa, Wake Forest, and Worcester State.