Dartmouth Center for the Advancement of Learning

February 1, 2021

The events of the last year have upended every corner of our lives and DCAL's work this year was no exception - the impact of the global pandemic completely reoriented our work with faculty and, consequently, has a deep impact on educators and students at Dartmouth. While the work has been difficult and frustrating at times, it has deepened our relationships and partnerships with educators at Dartmouth and greatly expanded our influence. Looking forward, DCAL is poised to lead Dartmouth, and for Dartmouth to lead higher education in the evolution of the liberal arts education.

In my report on the year, I'll try to cut through the chaos of the pandemic and tell you that story - the story of DCAL's leadership and of the extraordinary work of our staff.

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# The Dartmouth Center for the Advancement of Learning

DCAL

Annual Report 2020

COVID-19: Remote Teaching and Learning

In January 2020, Josh Kim, DCAL's Director of Online Programs and Strategy, came into my office with a question - *what will we do if the novel coronavirus outbreak in China spreads to the United States*? We thought about responses to previous outbreaks like H1N1 and quickly realized two things: COVID-19 was looking to be much more deadly and infectious, and that the educational and technological landscape had evolved significantly since 2009. We needed a new plan. So, we sat down with Erin DeSilva, the Assistant Director of the Learning Design and Technology team, to sketch out a rough idea of how to sustain Dartmouth's educational endeavor. We brought together our collective expertise in online teaching, pedagogy, and technology to think about how to best serve our students and faculty in a remote learning environment and identified the enabling tools.
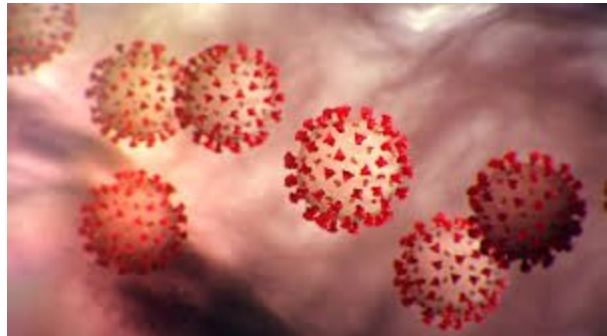
As we all have directly experienced over the last year, viruses can spread very quickly and by March, decisions came at a rapid pace culminating with the move to hold our Spring term entirely remotely. At that moment, our campus had two weeks to prepare to offer all of our courses in an entirely new way. That rough sketch was our blueprint for action.

First, we created a cross-campus academic continuity team combining DCAL, the Learning Design and Technology team (ITC), members of the service desk (ITC), the classroom technologies team (ITC), and the subject Librarians who work with the various departments and programs. Provost Helble charged this team with making sure Spring term launched successfully by helping and supporting faculty to the transition.

Simultaneously, led by the Learning Design and Technology, we pitched in to create a new resource for faculty at Dartmouth - teachremote.dartmouth.edu. This website distills all of our advice and expertise into a set of best practices, concrete steps to move a course into the remote setting, advice and guides on integrating technological solutions, and opportunities for training and consultation. Within ITC, almost all of their staff were reassigned to provide any needed technical support and troubleshooting for our main technologies and the capacities and licensing for them were greatly expanded.

Second, we formed an academic continuity team for each department and program on campus consisting of a team lead from DCAL or LD&T, a subject Librarian, and 1-2 technical support people from the service desk. These teams rapidly met with all the faculty teaching in the Spring to triage the situation with their course, identify solutions, and help faculty to implement

The combined DCAL and LD&T teams working on academic continuity.

them. As we made this mad dash towards spring, campus closed and essentially all faculty and staff began working remotely, removing yet another layer of normalcy in our work.

All of this work paid off - every course started on time in the Spring with students engaging with their courses from home using tools like zoom, canvas, and multimedia resources. The academic continuity teams continued in their support, helping faculty think clearly about good pedagogical choices for their students and help them learn the technologies that facilitate them.

Summer was another entirely remote term, but starting this fall we have a mixture of on-campus and remote students. We continue to work closely with faculty through the academic continuity teams to help them rethink and improve their teaching.

Of course, we are not alone in our COVID-19 experience and drew heavily on our professional networks with our peer institutions. Josh Kim, our Director of Online Programs and Strategy, is a leading voice in the national conversation. He and his co-author, Eddie Maloney, published two books this year. The first, *Learning Innovation and the Future of Higher Education,* looked at the trends and future possibilities for Higher Education. They wrote the second, *The Low-Density University* (both JHU-Press), quickly in response to the nationwide shift to remote teaching, exploring many possible variants answers to the question of how to continue the educational mission during a pandemic. He and Eddie spoke in many venues and with many institutions as we all tried to figure out how best to plan.

COVID-19: Learning from our experiences

Of course, not everything worked perfectly - some students had access issues, some of the translations of the courses worked better than others, and there were the inevitable technical glitches. To help us learn from our initial foray into remote teaching and learning, we fielded a student survey at the end of Spring term with the aim of finding out what students valued in the new environment as well as what types of problems they were having.

We distilled the results into six big lessons:

Empathy. Many students acknowledge that the move to remote teaching was a difficult transition for faculty as well as students and appreciate the effort the faculty are making.

Students had both good and bad experiences with remote learning. In the free response questions where students wrote about their impressions of the remote learning experiences, half commented negatively and half positively.

No one methodology elicited uniform positive/negative responses. Students described their experiences with asynchronous and synchronous course components with mixed results depending on how effectively the instructor used them.

Students need structure to help them be successful. Without the guides and rhythms of the residential experience, students struggled with time management, motivation, and organization. Course components they found ineffective were often linked to a lack of structure incorporating them into the courses.

Students miss opportunities for interaction with one another. Many felt this was the major missing piece from their Spring term experience.

Well designed courses led to good student experiences. Clearly communicated learning objectives, grading criteria, and course structures; multiple opportunities for assessment; and student-faculty/student-student engagement opportunities all contribute to student success.

This information proved exceptionally helpful to faculty going into summer and fall terms - we built workshops and training around the idea of *facilitating student-student interaction* and showcasing some examples of courses that were working well through *intentionally crafted linkages between synchronous and asynchronous course components*.

Our interventions were very successful! Student responses in the summer and fall surveys showed significantly higher satisfaction with the synchronous and interactive parts of the courses in summer and fall than they did in spring. More broadly, the chart below shows the change over time in student reports of courses that were particularly good remote experience as well as those where they felt disengaged. With the exception of the Science division, we see significant improvements over time.

If you are interested in delving into this further, we've attached the Spring report in an appendix.
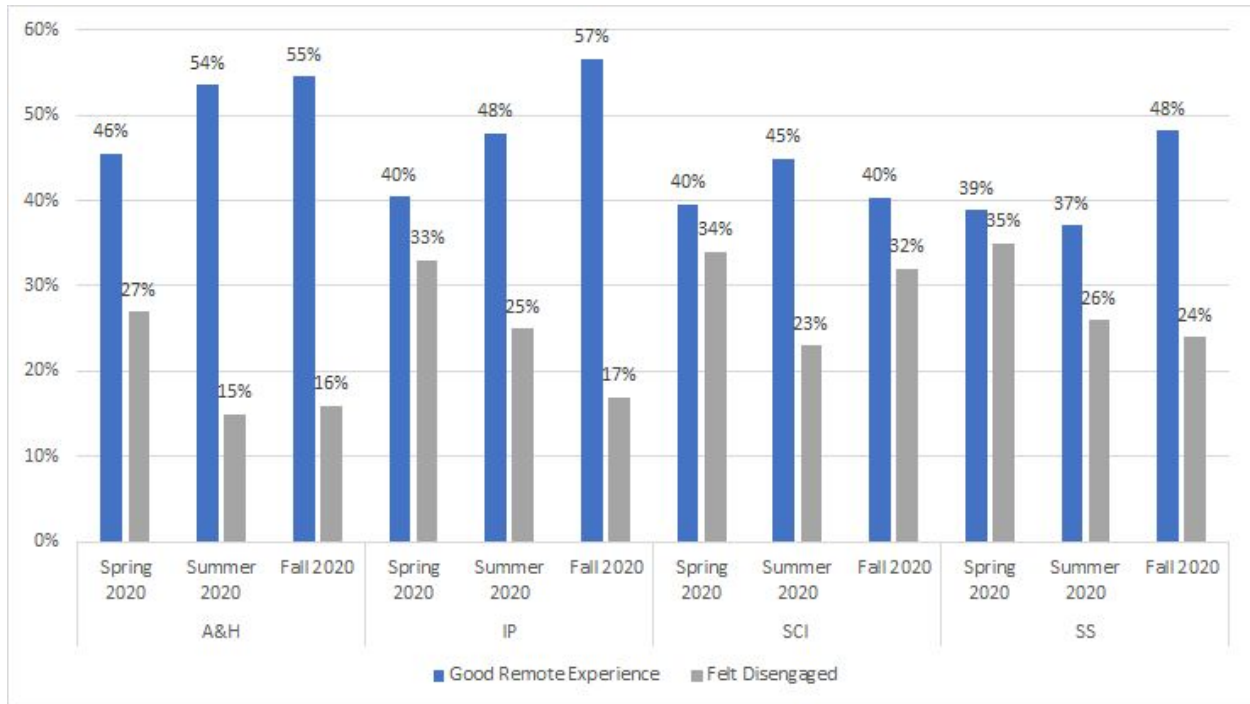
Programming for educators at Dartmouth

During the pandemic, our normal programming and engagement through consultation, workshops, and learning communities was substantially augmented by our work with the academic continuity teams who worked directly one-on-one or with small groups of educators.

We also reoriented our programming to better serve the immediate needs of faculty, postdocs, and graduate students during the switch to remote teaching by offering a larger proportion of our workshops on technical skills/training and aspects of course redesign for the remote environment.

Faculty Development

Elli Goudzwaard, DCAL's Associate Director for Faculty Programs and Services, heads up our programming efforts aimed at faculty and other educators at Dartmouth.   As much of our programming was disrupted due to the shift to support through the academic continuity teams, some of the planned programming experiments were delayed or changed. However, she coordinated a successful launch of several Learning Communities in winter 2020 on topics such as inclusive teaching, AR/VR, promoting faculty/student engagement, off-campus programs, and classroom spaces. We've resumed this experiment in Fall 2020 with a learning community on anti-racist pedagogy.

Elli coordinated and helped run workshops and training sessions: DCAL hosted 22 events with 324 people in attendance and 240 unique individuals. Roughly 20% of individuals were tenure

or tenure-track faculty, 31% were non-TT faculty, 27% were staff, and the rest were graduate students, postdocs, and other members of our community.

Future Faculty Development

Associate Director Cindy Rosalbo heads up our programming efforts for future faculty - graduate students, postdoctoral associates, and others that are at the beginning of their academic careers. In Fall 2020 she ran 14 programs, producing 22 sessions, some of which are in collaboration with the Guarini School for Graduate and Advanced Studies. There were 185 participants overall, and 107 unique participants from 23 programs and departments. Data were not tabulated for winter, spring and summer, which included DCAL's 8-week Future Faculty Teaching Series offered each term and multiple offerings of Remote Teaching for TAs, Zoom practice sessions, and more.

A new wrinkle this year was that the switch to remote teaching and learning shifted all of Cindy's programming to remote presentation as well. While many of these were managed in synchronous sessions using Zoom and other tools, she converted her Graduate Teaching Assistant Curriculum to an asynchronous, self-paced course. Sixty graduate students joined the course.

The Learning Fellows Program

Our Learning Fellows Program is now well established and in such high demand that we cannot expand it further without dedicating more resources. We've seen remarkable growth since the beginning of the program, as demonstrated by the chart to the right. At our current size, almost half of all students at Dartmouth experience a course with Learning Fellows each year.
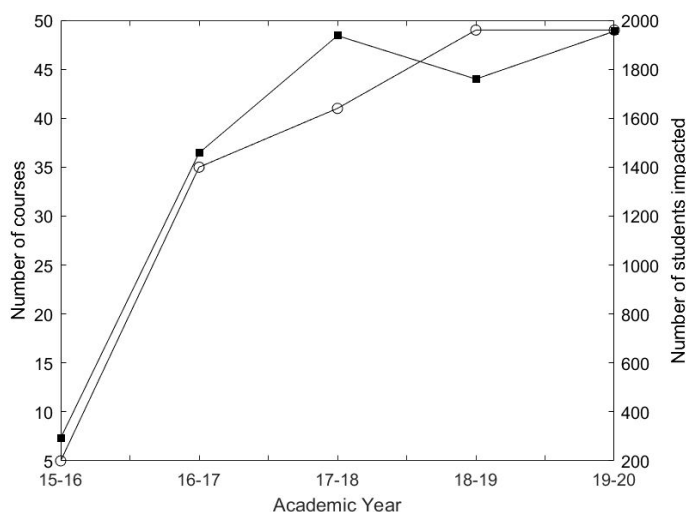
DCAL, and this program in particular, is a focus area in the capital campaign where we are looking to make the program permanent and provide an avenue for growth. To assist in this effort and to give ourselves benchmarks for improvement, we contracted with an outside firm to perform an evaluation of the program. The initial data is very encouraging - the positive
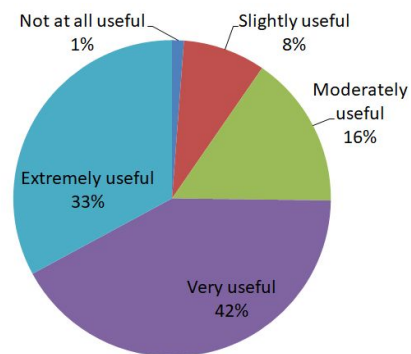
impact of the program on the students in the course and the learning fellows themselves is substantial. In our student surveying, we asked students to gauge the usefulness of the learning fellows facilitating group work to their own learning. The pie chart to the right shows the breakdown of responses with 75% of students finding the group work very or extremely useful. Similarly, the impact of the Learning Fellows on a wide range of student outcomes was overwhelmingly positive with every category scoring over 85% in agreement (see chart below). Most gratifying are the highest scores for statements about content mastery and the ability to work with others. The first speaks to one of Dartmouth's core missions in teaching and learning - providing students with the opportunity to engage deeply with a variety of subjects. The second speaks to our broader goal of creating a vibrant and collaborative intellectual community at Dartmouth. And, in surveys potential employers of college graduates cite working in teams as a core competency.

Our program is also beneficial to the Learning Fellows themselves. The main significant gains along several dimensions: greater mastery of course material, increased confidence in working with students, and increased interest in pursuing a career that includes teaching. Eighty one

% of students who agreed having an LF facilitate group work helped them improve

understanding of the topics covered	96%
skills specific to the subject	95%
comfort working with classmates on group activities	94%
ability to work through course material with other students	94%
ability to give help to or receive help from other students	93%
motivation to participate in group work	92%
quality of course work	91%
engagement and interest in the course	91%
enjoyment of group work	90%
appreciation of classmates	88%
ability to work with students with different backgrounds	86%

percent of the respondents rated their experience as a fellow as very good or excellent with another 17% rating the experience as good. And, sixty percent of the respondents indicated that they were enthusiastic about the program and would or had recommended it to others.

In our move to remote teaching and learning, the Learning Fellows program had a large positive impact. Courses that had been designed to use Learning Fellows were generally easier to move into the remote environment as they already had a lot of flexibility built into the structures. Further, all of these courses use group activities facilitated by the fellows, so again there was built in structure for students to interact with one another, with the learning fellows, and with the instructors.

Learning Innovation

In January of 2020, DCAL was pleased to bring Mike Goudzwaard on as our new Associate Director for Learning Innovation. This position, new to DCAL, allows us to recognize, capture and guide the innovative ideas, initiatives, and experiments both on campus and across the higher education landscape.
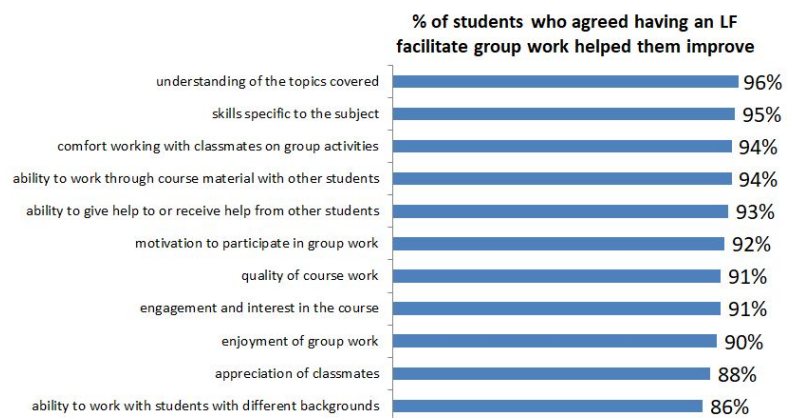
Experiential Learning

Since its inception, DCAL has managed President Hanlon's Experiential Learning Initiative. While the initiative officially ended in Spring 2019, we continue work to bring more experiential learning opportunities to students at Dartmouth.

This year witnessed two large curricular revisions - in Sociology and Physics - that aimed to weave experiential learning into the entire major curriculum. In Sociology, we worked with faculty to create a new, experientially oriented track for their major. This track moves students through courses with experiential learning components and culminates in a "real-world" project oriented course. In Physics, all majors eventually associate themselves with a faculty member's lab and engage directly in research projects. Our work with them centered on rethinking aspects of their curriculum with that goal in mind and creating a new transitional course where students would prepare for their movement into the lab setting.

In response to the shift to remote teaching, we relaunched a small grant program that could fund smaller experiential learning ideas in the remote environment. Under Mike's guidance, we were able to fund 24 ideas for a total of $54,790.

In response to the protests and national discussion on race and racism in the United States, we included in the call for small grants a preference for those that addressed topics in anti-racism or that adopted anti-racist pedagogical techniques. Many of these 24 projects had these components.

Design Thinking@Dartmouth

This year DCAL was the recipient of a generous $1,000,000 current use gift to support infusing Design Thinking across the curriculum through interdisciplinary offerings. In partnership with Engineering, who already have a successful (but small) Design Thinking portfolio, we will be developing new courses and course components that bring the tools of Design Thinking into the curriculum across campus. This initiative will help build the curricular foundation for Thayer's envisioned Design Institute at Dartmouth.

Online Offerings at Dartmouth

Dartmouth is experiencing an explosion in interest in creating online certificates and programs. Three factors explain most of this growth. First, the professional schools need to move some of their programs, mostly at the Master's level, to low residential or online modes to remain competitive with their peers. Second, the experience with remote learning has lowered the barrier to entry for many faculty, who now see online offerings as both valuable and useful. Last, as Dartmouth grapples with a structural budget gap, expansion of online opportunities is a possible line of new revenues.

DCAL sees these pressures as an opportunity to advance learning across Dartmouth's landscape and to expand access to the unique educational opportunity that Dartmouth provides. Josh Kim, DCAL's Director of Online Programs and Strategy, has worked tirelessly over the last few years to lay a strong foundation for this work and we are now reaping the rewards. Let me share a few of the success stories of the last year.

Dartmouth expands its online footprint

Each of the professional schools continued exploring the online landscape to meet new demands and respond to challenges.

In the Thayer School of Engineering, we facilitated the creation and launch of a Professional Certificate in Applied Data Science through a partnership with [Emeritus](#). This new foray into online learning is a first step for Thayer in exploring the possibilities of further certificates and degree programs that are completely or partially online. That exploration continues with the development of a certificate in Digital Transformation, which Dean Abramson sees as a solid step towards an initial fully online Master's degree.

The Geisel School of Medicine is also pursuing online approaches. The program in [Quantitative Biomedical Sciences (QBS)](#) is currently developing their own Professional Certificate in Applied Data Science, again in partnership with Emeritus. Other potential projects across Geisel are in brainstorming and planning stages.

The Tuck School of Business has long had an interest in expanding its online footprint but it remains challenging to find good ways to do this while retaining their reputation for hands-on work that builds strong and lasting relationships. Their initial steps have been to rebrand some existing executive education offerings as Dartmouth offerings and to explore further areas of executive education that would have synergies with their other offerings.

While the work with the Professional schools is spearheaded by Josh Kim, another part of our portfolio is managed by Mike Goudzwaard, our Associate Director for Learning Innovation. This portfolio comprises our MOOC collection and, more generally, offerings of individual courses. As we see the surge in interest in digital offerings, Mike is working on bringing out two new courses. The first is an initial curricular offering from the new [Arthur L. Irving Institute for Energy and Society](#) on Energy Justice (the new space for Irving is under construction - see the image on the right). The second is a course in computer science on Full Stack Web Development. Both of these represent exciting new avenues of teaching and learning for Dartmouth.

The Energy Justice course has cross disciplinary appeal for learners interested in energy policy, energy generation, social justice, and social systems. It is also unique at Dartmouth in that it is a course outside of the traditional disciplinary and departmental boundaries and will be offered to both Dartmouth students and external learners.

Full Stack Web Development grew out of an existing course in computer science and jump-started by the switch to remote teaching and learning. Tim Tregubov taught this course remotely in the spring and consequently generated a large amount of video content, assignments, and other course materials. He is working with DCAL to assemble this into an online offering that supports his Dartmouth course, supports training teams in the DALI lab where he is the Director, and provides this opportunity for learners outside Dartmouth. Developing this course may allow Tim to add additional sections of his residential course and generally expand access across the community.

A new partner: Coursera

One of Josh's big achievements of the year was negotiating a contract with a new partner, Coursera. Coursera is one of several existing online learning platforms where Dartmouth can build and host courses, certificates, and degree programs. We already have one such partner, edX, and adding another brings us more flexibility and opportunities.

Coursera brings a huge base of learners - 75 million active users - and a robust mechanism to market offerings to them. This helps us meet one of the big challenges in online education, generating interest and recruiting students. While the Dartmouth brand is enormously strong as a residential college, we are at the beginning of the road in building Dartmouth's reputation for online learning.   The Coursera agreement also included an influx of capital - a $250,000 grant to fund a set of initial offerings. A portion of this grant will fund the development of the Digital Transformation certificate mentioned above.

This agreement and the funding that comes with it will provide a real boost to our online efforts, jump-starting the process and allowing for a rapid expansion.

DCAL's role at Dartmouth

The pandemic upended education at Dartmouth and brought DCAL into new roles with new responsibilities. Before last March, DCAL's focus was to provide professional development opportunities for educators at Dartmouth enabling their growth as teachers and mentors. This

work is optional on the part of educators - a collaboration between partners with a common passion for bettering the student learning experience.

The ramifications of COVID-19 raised the priority of our work, pushing it to the front of the line, and became somewhat less optional - educators were pushed to work with us in moving to remote teaching due to the emergency at hand. This shift for us has significant ramifications that we are, in part, still working through. It brought us much closer to many educators at Dartmouth and revealed the support we can provide to many on campus who were not terribly aware before. We've become much more recognized as the "go-to" for pedagogical and education questions. While not formalized, this will be a huge boon to the work that we do.

In the other direction, the collaboration with Deans, the Provost, and other administrators necessitated by the shift has changed the perception of DCAL as an advocate for faculty a bit, pushing us more towards administration and leadership. We will need to navigate this carefully going forward - our increased connectivity to leadership, particularly with the Deans, is an important collaboration in support of educators at Dartmouth but we wish to emphasize our primary role as an advocate for those educators.

Part of this has expanded my own role as faculty Director. As part of the discussions that helped plot our course in the Spring and thereafter, I entered into much more significant collaborations with the Deans of the Schools as well as the Provost. I also became a conduit of information about the logistics of running a course - room usage, technology acquisition, support questions, etc. - for faculty and chairs of departments and programs. This cross-campus coordination has not been as strong in the past as we needed during the switch to remote teaching and learning and that we will likely need going forward.

Re-visioning the liberal arts education

As I write, the United States is in the midst of distributing the first COVID-19 vaccines, showing us a light at the end of the tunnel - within the next year, we hope to see a more complete return to campus and the resumption of at least much of the residential educational offerings. Looking towards this future, our campus community is grappling with what exactly Dartmouth will be when we come out of the pandemic. Will we return to the pre-pandemic status quo? Will we continue to have some remote classes, or courses with remote components? What are the gains we made during the

Philosophia et septem artes liberales, the seven liberal arts. From the *Hortus deliciarum* of Herrad of Landsberg (12th century)

pandemic that we'd like to keep? How do we prepare for other significant (but hopefully rare) disruptions of campus life?

At DCAL we are continuing data collection, conversations with faculty, and surveying students to aggregate all of this information to distill it into a collection of "lessons learned." Learning innovation has exploded in the last year and we are well on our way to finding out what worked and what didn't at Dartmouth. The gains we can easily see are fairly granular - for example, the success of tools like Hypothes.is and Voicethread, building community and connection through intentionally social and educational activities, and providing clear structure and expectations for students. But what is the bigger picture?

Dartmouth prides itself on providing a phenomenal liberal arts education. We invite students to delve into a wide variety of subjects to develop a broad base of knowledge and common intellectual framework for inquiry. We don't do this for the sake of "well roundedness" but because we believe that the problems that face us can only be addressed by drawing on a diverse set of methodologies across many traditional disciplines. We cannot use machine learning to provide solutions using massive data sets without considering the ethical and social ramifications of doing so. So our budding computer scientists need not only programming and computational skills, but other tools of inquiry from philosophy, ethics, and the social sciences.

At DCAL we see several paths Dartmouth might take to integrate what our COVID-19 experiment has yielded to recreate the liberal arts experience, making it better while preserving Dartmouth's commitment to its priorities and values. We see two core tools that we can exploit: the ability to *engage groups of people that are physically separated from one another*, and the ability to *create quality educational experiences that can be accessed anytime from anywhere*. While these are not new in higher education, they are in many ways new to Dartmouth and can be used in uniquely Dartmouth ways.

One possible direction is to capitalize on the strong and devoted alumni that Dartmouth produces to provide continued connection and engagement between alumni, faculty, staff, and current students. Part of this lies in opening up more distance learning opportunities like the certificate and degree programs we are currently working on, but also to provide different levels of connectivity through mentoring, guest lecturing, and internship opportunities. Using remote learning techniques can vastly lower the barrier to entry and allow for lifelong engagement with the Dartmouth community.

The benefits here are potentially huge. Current students would gain access to the experience and points of view of alumni working in a variety of fields. Imagine bringing in virtual guest lecturers into a discussion of housing policy that include people working in the federal government on national policy, those who work in property development and construction, others who work for social service organizations that provide low-income housing, and others still from local governments grappling with generating economic growth in their communities. From that debate, students could partner with journalists to write white papers, policy briefs, or pieces to inform the public. Integrating these different perspectives sits at the heart of the liberal

arts and fostering this integration through alumni relationships capitalizes on the Dartmouth connection

Another direction is to create more flexible learning options for primarily residential students. Creating educational experiences on a smaller scale than a full course and constructing them so students can work on them at their own pace and with their own priorities can open up a wealth of new possibilities. Students could try out different subjects and areas of study before committing to a class, or refresh their knowledge of prerequisite material before jumping into a class. Students who are in an off term or off campus (e.g. on a foreign study program) could use these to keep up their skills or prepare for an on-campus term. Tim Tregubov's Full Stack Web Development course I discussed above is a good example of this development of material to extend access.

Other examples of how this might work arise in skill development as well as in curricula that are highly sequenced. A trend on campus is the higher need for basic programming or software skills in more and more courses of study across all divisions. We see more courses where students need to use software packages to do statistical analyses, make visualization, create multimedia objects, and so on. Small online tutorials in these skills could help students prepare for a course or learn the needed skills alongside the class.

Sequential curricula - like in my own department of Mathematics or in the language departments - often see students struggle in upper level courses because they need to review earlier courses they may have taken a long time before. Offering asynchronous self-paced and modularized versions of the introductory material provides students with ways to keep themselves current or to get back up to speed when they need to.

The benefits I've described focus on Dartmouth students - this is appropriate as those students are at the center of our educational mission. But an online footprint is also outward facing, allowing external learners the benefits of Dartmouth's high quality educational offerings. These ideas dovetail nicely with an expansion of low-residency or fully online certificates and degree programs that the Professional schools are pursuing. Taken together, these offerings will provide learners around the world the opportunity to engage with education through the lens of the liberal arts. This fills a gap in the current collection of online opportunities and Dartmouth, a world leader in providing a liberal arts education, is just the institution to do it.

Appendix: Spring 2020 Student Survey

Dartmouth Center for the Advancement of Learning
Information, Technology, and Consulting
Office for Institutional Research

June 20, 2020

Introduction and Methodology

At the end of spring term, we fielded a student survey on experiences with remote teaching and learning to better understand where students were finding successes as well as challenges in the remote environment that is new to all of us. We are using this data to structure our faculty support for summer and fall terms, prioritizing:

- Building instructor presence
- Mixtures of synchronous and asynchronous elements aligned to course goals
- Strive to ensure equitable access for all students
- Deliberate focus on student interaction
- Emphasis on clear structure and communication

Fully online programs identify three primary features that contribute to program success: faculty presence, course design, and student support. Of these, the last is most difficult to translate from the residential setting. Our focus on remote (as opposed to online) teaching acknowledges this: online programs centralize and personalize learner support by tracking student engagement and providing one-on-one academic coaching. Dartmouth's approach to student support spring term remained decentralized and distributed across several units.
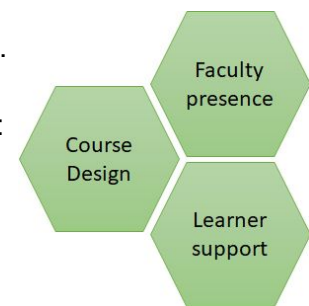
Consequently, our survey data yields information on the first two components - faculty presence and course design. Given the heterogeneous nature of the feedback we received from students, we adopted a qualitative analytic approach.

Our survey yielded a 36% response rate with small but significant differences in response rates across different groups. Women responded at a higher rate than men (+8%). White students responded at a higher rate than minority students (+3-8%). Non first-generation students responded at a higher rate than first-generation students (+6%). Sophomore responded at a higher rate than students of other class years (+4-10%). This raises the possibility that our survey may have undersampled important components of the student population and may also have undersampled disengaged students.

Central Findings

Empathy. Many students acknowledge that this was a difficult transition for faculty as well as students and appreciate the effort the faculty are making.

Students are having both good and bad experiences with remote learning. In the free response questions where students wrote about their impressions of the remote learning experiences, half commented negatively and half positively.

No one methodology elicited uniform positive/negative responses. Students describe their experiences with asynchronous and synchronous course components with mixed results depending on how effectively the instructor used them.

Students need structure to help them be successful. Without the guides and rhythms of the residential experience, students struggle with time management, motivation, and organization. Course components they found ineffective were often linked to a lack of structure incorporating them into the courses.

Students miss opportunities for interaction with one another. Many feel this is the major missing piece from their Spring term experience.

Well designed courses led to good student experiences. Clearly communicated learning objectives, grading criteria, and course structures; multiple opportunities for assessment; and student-faculty/student-student engagement opportunities all contribute to student success.


The student survey provides us with a rich set of data about student experiences in spring term. Like our regular end of term evaluations, we can find information about how to change our courses to make student experience and student perception of the course better. We found five themes and a unifying principle in our data analysis. Overall, students understand that we are all in a difficult situation and are trying to make the best of it. But, the majority of students are having at least some bad experiences with their classes.

Courses that yielded good experiences had two major commonalities - useful and transparent structure, and scaffolded opportunities to work and interact with their fellow students. Courses that led to worse outcomes lacked something of these - poor structures, unclear communication, and/or isolation from other students. The choice of structures and tools to enable them were not very important - the care and intentionality of the instructors were key: good design meant good experiences.

Students had mixed experiences in the Spring

In the free response portion of the survey, we asked students a pair of questions about their courses. First, we asked them to identify courses with particularly effective remote teaching and to describe them. Second, we asked them to identify courses where they felt disengaged and again asked them to elaborate. In the figure to the right, we report the percentages of students reporting zero to four courses in each category. Importantly, 22% of students reported no courses where they were disengaged but 13% reported that none of their courses were particularly effective. Most students reported that some of their courses were effective but that in other courses they felt disengaged.
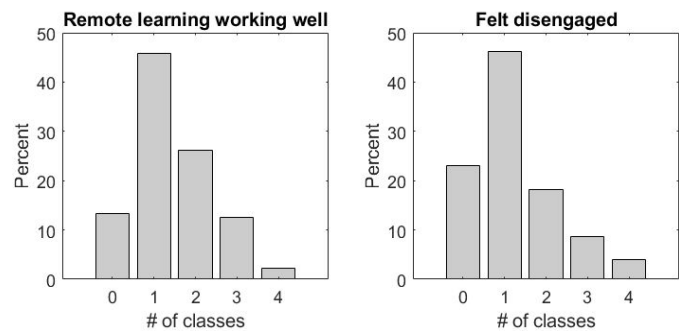
Aggregating this by course (again to the right), we see that 28% of courses students reported on had only positive comments while 15% had only negative comments. Thirty-two percent of courses had more negative than positive comments while 52% had more positive than negative.
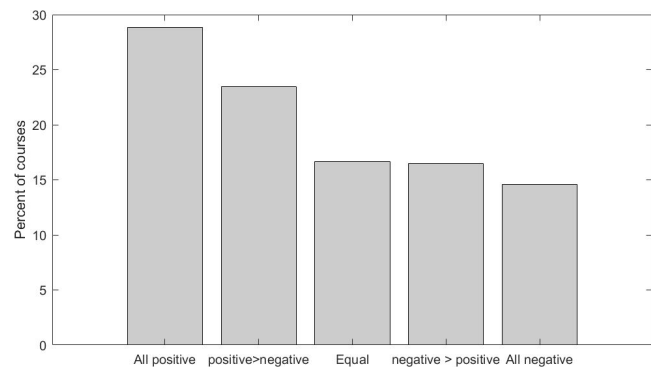
We know from our standard end-of-term evaluations that there is variability in student perception of residential courses as well but an apples-to-apples comparison is not entirely possible as we probed these variables in different ways. From these results we can conclude that many courses provided reasonably good student experience in the spring, but a significant proportion fell short. Importantly, more than three-quarters of the spring term students felt disengaged in at least one of their courses.

Students need clear expectations and structure

The residential environment provides many visible and invisible structures that help students organize their curricular and extracurricular activities. Absent these, in the remote environment students rely on their courses for the guidance and frameworks that they need. Consequently, students reported positively about courses when there were clear expectations and well understood goals alongside transparent structures to help them achieve them.

For example, one of the new, and often confusing, features of the spring was the switch to CR/NCR for all grading. Dartmouth elected this grading system in acknowledgement of the challenge students faced in quickly moving to a remote learning environment. Given the rapidity of the change, many faculty were confused about how this could be instantiated and so were students. Overall we saw that 11% of students disagreed or strongly disagreed that they understood what it took to get credit in the course. In the free responses, about 8% commented explicitly on the clarity of course expectations with a 47/53% split between positive and negative comments. Again, faculty who were clear about grading mechanisms were seen positively while those with unclear or changing schemes were seen negatively.

<u>Student Comments:</u>

Unstructured
"I wish I enjoyed this class because I know the professor is amazing and it gets rave reviews on campus. But by making it entirely asynchronous, some of the assignments feel like busy work and I have little incentive to do them well, especially without grades. I forget about this class over the weekend and just quickly do assignments before they are due, rather than continuous learning throughout the term."

"Another reason [I felt disengaged] was that these courses didn't have rigid deadlines; either homework assignments were due once a week, not at all, or the end of the term. I'm home and already pretty unmotivated to work, and without deadlines to push me out of bed in the morning the course is pretty much busy work."

Structured
"Class is well structured, it's good to make sure these classes have structure or else the course will be very confusing and stressful. Online learning is very far removed from in person learning so there needs to be as much communication and organization as possible."

"AAA is well organized and the class meets every M, W, F, so it is easy to stay on track. The class only has 8 students, and we often split into breakout groups, so there is a lot of interaction between students and with the professor."

"BBB is entirely asynchronous, which is fine, but Professor XXXX designed the course well so that we have a quiz every Friday. Online classes are generally easy to fall behind in, and this ensures that we are caught up by the end of each week."

Students are looking for opportunities for interaction

Students return to two themes often - the desire for interaction and relationship building with their instructors and for interaction with each other around the intellectual content. The last area, as seen here, is where a significant minority of students find Spring term lacking. However, the courses students talked most positively about almost always highlighted the ways interaction made the course better. Students see interaction as central to their learning.

In free responses about 18% of respondents commented specifically on student interaction with a roughly 50/50 split between positive and negative comments. About 20% commented on faculty-student interaction, with a 60/40 split between positive and negative comments.

There are opportunities to engage with other students

Legend: Strongly Agree, Agree, Disagree, Strongly Disagree

	Strongly Agree	Agree	Disagree	Strongly Disagree
All	40	35	18	7
SCI	34	39	21	6
SS	38	29	20	12
AH	50	35	12	3
IP	39	41	14	5

There are opportunities to engage with the instructor

	Strongly Agree	Agree	Disagree	Strongly Disagree
All	50	39	9	2
SCI	46	42	9	3
SS	48	39	10	3
AH	58	36	5	1
IP	49	39	10	2

Student Comments:

"Engaging with other students is a really important part of the learning process and it helps to hear other students' questions and know who is in my class so I can talk to them outside of class. This is also particularly helpful because it offers a way to keep myself accountable for keeping up with material."

"I always think I understand the pre-recorded lectures until it is time to do homework, and then I realize I don't really understand. Office hours with the professor are helpful, but there aren't enough of them. If I was at school, I would get to know others in the class and be able to ask them for help, or have a tutor that I could ask for help."

"I have found that the small group discussions allow us to dig deeper into issues, and then we get to hear all of those ideas during our larger discussions. It's not quite as good as being in class, but I think that it has come the closest to feeling like a real class for me."
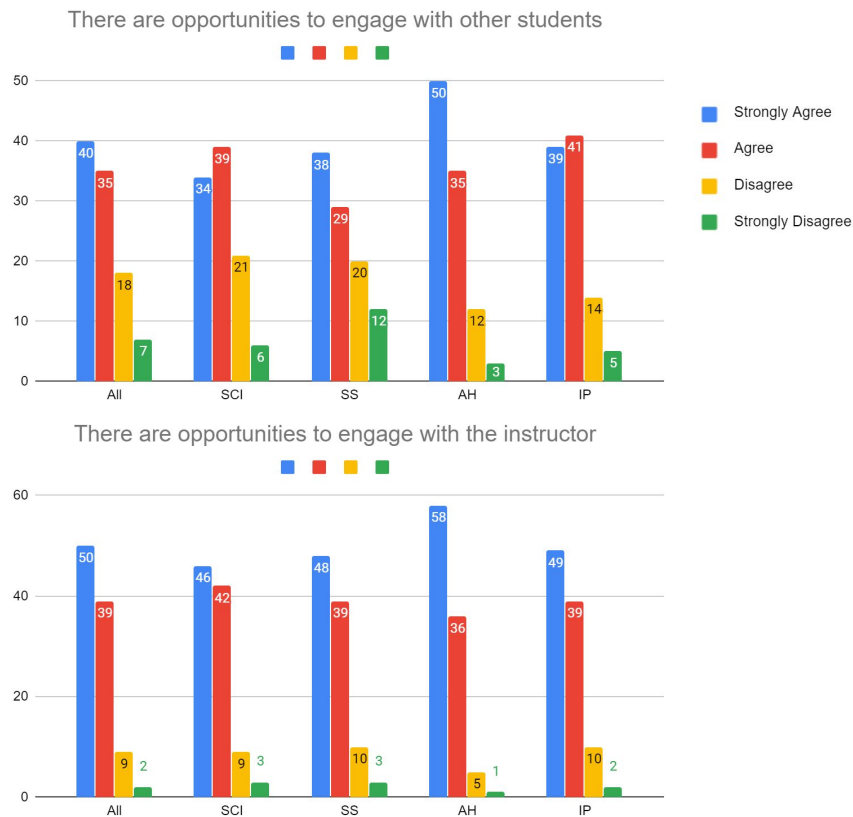
Meaningful interactions are structured and integrated into the course

By student report, successful courses provided different opportunities for students to interact around their work in the course in ways that directly connected to the course goals and student learning. Instructors used both synchronous and asynchronous methods to facilitate interaction with the most positive comments associated with linking both methods together.

Student Comments:

"I really enjoy our discussions as a class on Zoom; it is the closest experience I have had over spring term that resembles being on campus."

"Zoom discussions are long, repetitive, and often don't help me understand the material."

"This class was entirely asynchronous, but discussion boards on Canvas were a fantastic way to engage with other students and allow us to complete the work on our own time."

"I generally dislike discussion board posts. A LOT."

"Discussion posts on canvas prepare us for real-time zoom conversations. The professor readily engages and encourages student participation. We meet in small groups once a week to engage more intimately with peers and other students. Course objectives are clear and the workload has been adjusted well to an online format."

Synchronicity and Asynchronicity

While students reported higher levels of dissatisfaction with some asynchronous components (e.g. discussion boards), they liked others (e.g. pre-recorded videos). Similarly, many students reported positively on zoom live sessions, often commenting on the ability to interact with one another, but others commented negatively. The latter often pointed to features such as the long length of some sessions, poor experiences when there were many students, and the lack of good design for the sessions.

The most positive comments came in two categories. For smaller, discussion based classes, students cited the primacy of the synchronous component as central to their engagement in the class. Our interpretation of this is that for small groups, zoom is intimate enough to foster engagement. For larger classes, a structured mixture of asynchronous and synchronous components drew the most praise. In these cases, synchronous sessions worked well when they were supported significantly by pre/post asynchronous preparation and interaction and when they used tools like breakout rooms to create more intimate and interactive groups.

For entirely asynchronous classes, comments were mostly negative due to perceived lack of engagement. Those that were positive echoed two themes. First, those courses were well designed and the instructors were actively engaged in the asynchronous mode of interaction, drawing students into the experience. Second, many of the students that liked the asynchronous experience appreciated being able to manage their time more flexibly, to be able to engage the material more often and more deeply, and typically reported adverse externalities (e.g. lack of stable internet, difficult home situations, etc.).

Student Comments:

"The asynchronous lecture videos for AAA are very effective and convey the material well. Alternatively, the synchronous lectures for BBB are very effective and offer the real-class feel. Both classes have office hour availability."

"CCC and DDD are mainly asynchronous and I feel like the class meetings aren't all that useful and are not engaging. I wish we met more regularly and had more structured content during classes."

"AAA and BBB both involve a lot of breakout room discussion, which I think is one of the best parts of zoom learning. CCC is a small class size (generally less than 10 students) so it feels like a breakout room anyway."

"I have felt very disengaged from BBB because I feel that it is a poorly structured use of class time. Our time block...is two hours long and for the entire live zoom meeting we only discuss as 1 large group. The professor does not utilize [different] in-class activities/techniques such as breakout rooms, online whiteboards, or other materials to keep students engaged, throughout the class. As a result, it is very difficult to remain focused for two hours just conversing as 1 large group on zoom."

"Although AAA is almost entirely asynchronous, the lessons are well planned and the use of technology is optimal. The teacher communicates often about how to do assignments and puts a lot of work into providing us with all the information we need. BBB is entirely synchronous and is really well planned and engaging. They both did an excellent job with effective communication and providing the schedule weeks in advance which allows for flexibility when it comes to planning your time."

"Dr. XXXX deserves a raise. She did an excellent job adapting to the remote environment. Pre-recorded lectures were accessible, well delivered, and informative. Small group breakout sessions involved direct contact with the professor. Discussion boards received comments directly from the professor as well. I can only imagine how wonderful this class must be in person. Overall, an excellent experience, namely because the professor took the time to engage with each student."

"I do not have WiFi at home so I've appreciated being able to download lectures when I can. I have to drive to a parking lot and sit in my car to access WiFi so I'm glad that I don't have to attend any live discussions or organize meetings with other students."

Good course design leads to good student experiences

To summarize the findings in the most succinct way, we simply observe that thoughtful course design and implementation yields good student experience. Conversely, if the course is disorganized, lacking in coherency, or otherwise disjointed, students have worse experiences.

Of course, this is true of residential courses. What are the novel wrinkles for remote learning?

Student Comments:

"My AAA professor has gone above and beyond to recreate the class experience over Zoom. He's had us do a variety of activities on Canvas, such as recording dialogues, mini quizzes, and writing assignments, and also has us meet 3 times a week for a shortened class period so we can ask questions and practice with our classmates. He prerecords grammar lectures that we can watch, and if we have questions, he's scheduled a one-on-one session for each of us on Thursdays where we can ask him directly and get individual practice. We also have drill which is a good way to practice listening and speaking, though it doesn't work as well over Zoom. Overall, I haven't felt that my AAA learning experience has been diminished greatly by being virtual, and I'm really thankful that my professor has been so helpful in accommodating for us online."

"The class is a highly collaborative endeavor between students and the professor... we engage in pedagogically rich discussions and work to develop a publishable academic experimental study as a class. Further, XXXX makes himself readily available to answer student questions, and the use of Slack for out-of-class communication enables students to easily seek answers from one another as well. XXXX also mixes up student groups frequently, allowing us to work with everyone in the class in smaller groups, so that we are all exposed to as many different perspectives and working styles as possible.... With such a high level of engagement in this course remotely, the course must be absolutely incredible in person... The success of this class is thanks to the hard work of the professor and the other students in the class, who are always ready to participate fully. "

Recommendations

Best practices for any setting:

- Create your course to meet the goals you have for your students.

- Craft intentional opportunities for students to work with you and each other on activities aligned with course goals.

- Provide rapid and continual feedback throughout the term. Use low-stakes assessments to both gauge student progress and provide feedback and guidance.
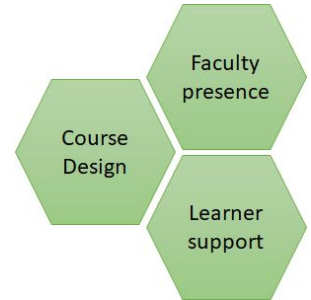
Best practices for remote learning:

- Intentionally build your own presence in the class.

- Use a mixture of connected asynchronous and synchronous course components to provide access to course content and activities to students with a wide range of constraints. Course size impacts the utility of different component choices.

- Design opportunities for students to interact with you and one another both formally and informally. Consider the students' experience as a remote learner as you craft your course.

- Strive to ensure equitable access for all of your students.

- Communicate clearly your course structure and expectations to students. In fact, over-communicate - students lack access to other channels of information that are present in residence.

Getting ready for fall:

- Teaching remotely takes more time than in-person teaching. If possible, embrace a team approach to teaching your courses - involve other faculty, teaching assistants, etc.

- Plan to participate in professional development opportunities offered by DCAL and Learning Design and Technology over the summer. Our programming is specifically aimed at remote teaching and learning.

Further data

For those interested in a deeper dive into the data we've collected we present additional items here.

Course Structures

Students report different course components across the curriculum. We see two themes: Arts and Humanities courses have a higher percentage of "live" components while Sciences and the Social Sciences have larger percentages of pre-recorded lectures and virtual office hours. This may correlate with class size: the higher enrollment courses in Spring are concentrated in the Sciences and Social Sciences while smaller, discussion-based courses are concentrated in A&H.
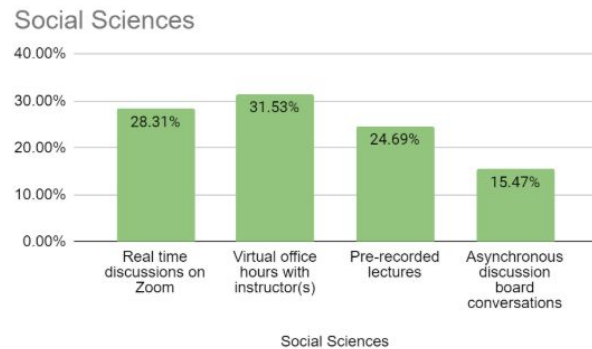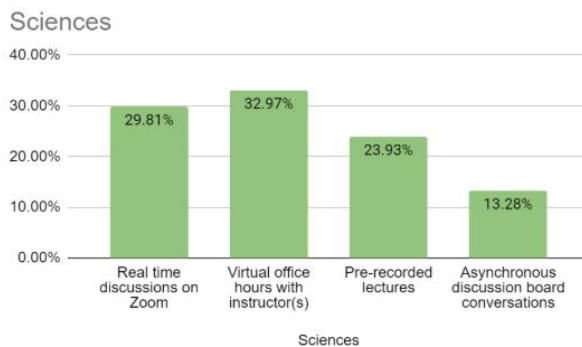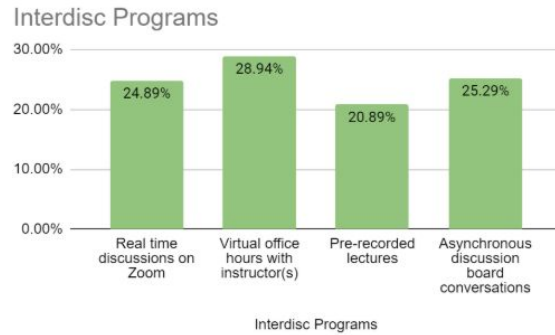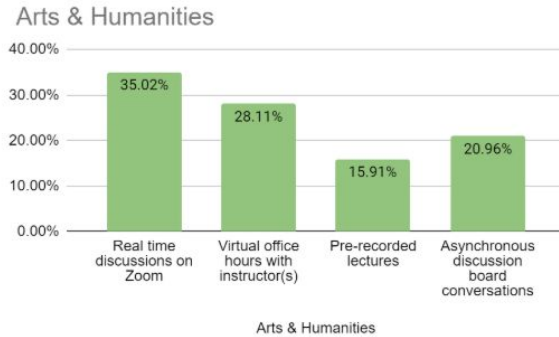

Component Effectiveness

For the courses that used them, a large majority of students found real time discussions, office hours, and pre-recorded lectures at least somewhat effective. Asynchronous discussion boards were the least effective, 17% of students (of those who had a course with a discussion board) indicating that they were ineffective.
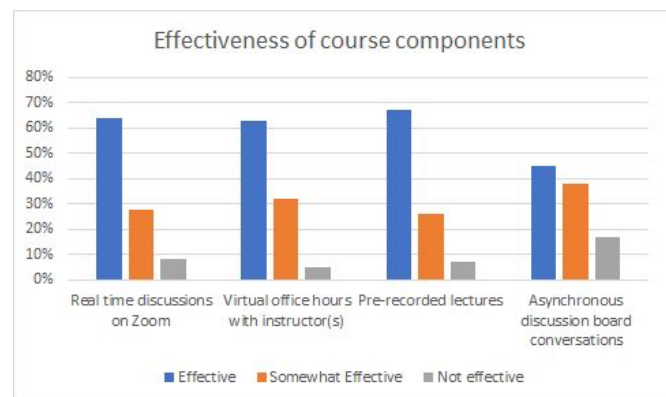
There are divisional outliers: SCI had lower effectiveness for live sessions and office hours. Sciences and social sciences had better effectiveness for pre-recorded lectures.

Extending these results using the free responses, we see scale and design as leading factors. Students comment on the ineffectiveness of live course components when there are too many people involved - large enrollment classes, crowded office hours - and when those elements do not have enough structure or linkage to the rest of the course. Discussion boards rate positive comments when they are well integrated and monitored while yield negative reactions when students feel like they are tacked on to the course or otherwise superfluous.
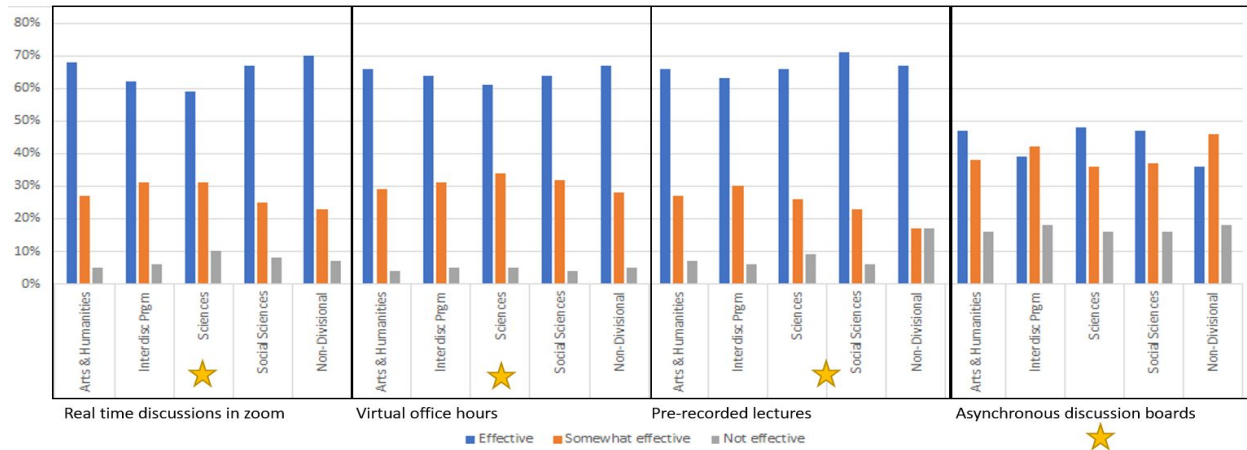
Agree/Disagree Statements

In addition to the engagement statements we tested with students, we included four others on clarity around earning credit, access to course materials, getting help, and contacting the instructor. Here, there was little variation across divisions and a large majority of students agreed or strongly agreed with the statements.

However, the relatively small number of students in disagreement with individual statements - up to 10-12% in some cases - are significant and, ideally, will be addressed going forward.

I know where to go to get help

	All	SCI	SS	AH	IP
Blue	52	52	50	57	52
Red	37	38	38	36	36
Yellow	8	8	10	6	8
Green	2	2	3	1	3

I know how to contact the instructor

	All	SCI	SS	AH	IP
Blue	59	55	57	64	62
Red	34	36	35	31	30
Yellow	6	7	6	3	6
Green	2	2	2	1	2