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THE CHRONICLE OF HIGHER EDUCATION

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A Year of Covid

FIFTY-TWO WEEKS AGO, campuses closed and higher education as we've known it came to a halt. We can all recite Covid-19's brutal toll: more than half a million dead Americans, millions of lost jobs (650,000 in higher education alone), billions in lost revenue for colleges and universities. Yet that grim calculus doesn't capture the myriad ways that individual lives have been upended, dreams deferred, research stalled, plans disrupted.

I was reminded of this a few weeks ago, when we asked readers of our Academe Today and Daily Briefing newsletters about their views and experiences of the pandemic. The responses were not without glimpses of an upside — some of you reported becoming more patient and empathetic — but the dominant theme was loneliness and loss.

"I feel separated from my students, my department, my university. I have lost any feeling of belonging."

"I have worked for a living for the last 50 years. I was laid off in June, and I don't know who I am anymore. What are we without our work?"

"It is going to take a while to get over the grief of this year."

In one way or another, *The Chronicle* has been asking two questions since this tragedy began: How is the pandemic changing higher education? And how many of those changes will stick?

This issue of *The Chronicle* is devoted to exploring what's changed, what hasn't, and what to expect, both in the individual lives of those who work and study at colleges, and in the health and functioning of our institutions.

Because the pandemic endures, the picture is fuzzy, the conclusions tentative. But what comes through is a weary resilience. For one thing, colleges have defied the dire prognostications of a year ago that as many as 1,000 would shut down permanently. As Rebecca Natow notes in her clarifying essay (Page 56), exactly 10 colleges announced they were closing or consolidating from the beginning of March 2020 to the end of January 2021. "The pandemic has not driven a large number of colleges past their breaking points," she writes, "at least not yet."

On the day this issue of *The Chronicle* went to press, around two million Americans received Covid-19 vaccinations. My inbox is flooded with announcements of a return to some version of campus life in the fall. For the first time in a long time, cautious optimism fills the air.

— EVAN GOLDSTEIN, MANAGING EDITOR

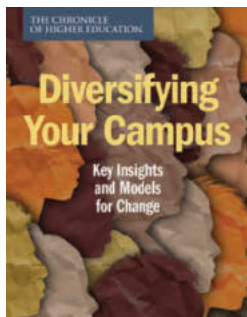


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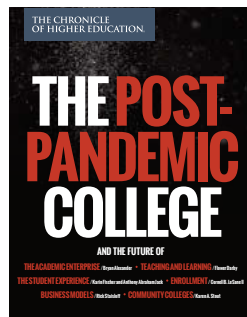
New from the Chronicle Store

Explore key questions surrounding the lack of racial diversity in the academic workforce with insights from campus leaders who have made changes in the status quo.

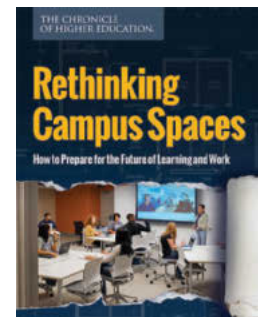
Learn what it takes to bring more diversity to campuses and how to tackle the structural barriers that hinder people of color.



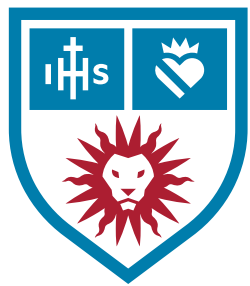
Leading experts **examine how the pandemic will shape higher education in the years to come** and what the college of the future may look like. Colleges must develop a more externally focused business model, direct resources to professional development, and continue to expand mental-health services.



Explore how Covid-19 will continue to have an impact on higher education long after the pandemic is over, and get advice on how your college can **take stock of unused spaces, address the concerns of prospective students, and look for creative new ways to make use of common areas.**



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FIRST READS

First mover | Straight dope | Abusive advisers | Pandemic perspectives

First mover

Cal State's Big Bet

LAST MAY, just weeks after college campuses closed in response to the coronavirus, the California State University system announced a decision that would send a sort of ripple across the nation's higher-education landscape.

Long before many institutions had set their plans — and despite a prevailing narrative that students wouldn't enroll — California State declared that the fall semester on its 23 campuses would be largely online.

That calculation, which risked the financial fallout of a remote semester to preserve the health of its communities, would be re-

peated by hundreds of institutions in the coming months.

In at least one way, the early call paid off. Keeping most students off campus and studying remotely didn't cause a big drop in enrollment. In fact, the system's student body grew slightly from the previous year.

"It seemed very clear to me that we would be much better off creating a degree of certainty in a time of great uncertainty," said Timothy P. White, who served as chancellor until the end of 2020.

The system is again ahead of the pack, announcing in December that it planned to open its campuses again in the fall. But it's unclear if that decision will be welcomed as much as the one in May, and if, after a year of studying remotely, students and faculty members will feel safe in returning.

The system's plan to open campuses for face-to-face instruction this fall once again

gives students and staff members lots of time to plan. But it's not clear that this early announcement provides as much clarity as the last one did, or that everyone is bullish about a return to campus.

In fact, campus life and the amount of in-person instruction could vary quite a bit by campus. The president of California State University at Chico, Gayle Hutchinson, announced in February that only 20 to 30 percent of fall courses might be fully or partly in person because of continuing state and county restrictions, along with the university's limited amount of space in classrooms for social distancing.

"There is no easy explanation of what this means for students," Hutchinson said in a news release. "Depending on your major and

your current progress toward graduation, it could mean a fully online schedule or one that is both in person and online."

Melys Bonifacio-Jerez, a senior at Chico State, said in-person courses are far better than remote instruction. But Jerez is still concerned about the spread of Covid-19. "We're all stressed. I'm definitely stressed," the student said. "I'm feeling like I can't keep going to school, but I'm pushing because it's important to me."

"The responsible thing would be to remain remote for fall 2021," Jerez said.

How much campuses can open for instruction will depend heavily on the availability of vaccines in the state, as well as the willingness of students and employees to be vaccinated, said Joseph I. Castro, the current chancellor, who took office in January after serving as president of California State University at Fresno. Officials are still discussing whether they can or will require people to be vaccinated before returning to campus.

The faculty union lists vaccine availability as the first of its 16 concerns about in-person instruction. Classroom space may still have to be adjusted and to require extra cleaning, and vulnerable faculty members will need options to continue to teach remotely, said Charles Toombs, a professor of Africana studies at San Diego State University and president of the union that represents most of the system's faculty. "What if there is an additional outbreak?"

The system is still waiting to see if the early announcement will pay off in the form of strong enrollment this fall. Applications to the campuses are about 5 percent lower than they were a year ago, according to a spokeswoman, but many campuses are still accepting applicants.

White, the former chancellor, takes the long view, noting that the system is already enrolling more students than ever, even in the midst of a global pandemic. "Come the fall of 2021, there will be a lot of students and faculty ready to be on campus," he said, "but many others who have discovered that remote learning works as well."

— ERIC KELDERMAN



AP PHOTO

Straight dope

Why a Professor Said He Uses Heroin

THE STIMULANT HEXEDRONE — known more commonly as “bath salts” — is the kind of drug Carl Hart believes would be ideal to take right before a hellish academic reception or departmental holiday party. He’ll do cocaine and ecstasy from time to time and is a fan of the opioids oxycodone and morphine for the “pleasurable calmness” they induce. But after a long day, there are few things that Hart, a neuroscientist and psychology professor at Columbia University, enjoys more than a few lines of heroin by the fireplace.

Hart has long pushed back against what he sees as the demonization of certain drugs and those who take them, particularly Black users, who are incarcerated at higher rates than white users. In his 2013 memoir, *High Price: A Neuroscientist’s Journey of Self-Discovery That Challenges Everything You Know About Drugs and Society*, Hart makes the case for decriminalizing narcotics and argues that “we’re too afraid of these drugs and of what we think they do.”

In his new book, *Drug Use for Grown-Ups: Chasing Liberty in the Land of Fear*, the former chairman of Columbia’s psychology department goes a step further, revealing that he has used — and continues to use — a number of illegal drugs. Hart, who is 54, tried heroin for the first time in his 40s and has used it regularly — and responsibly, he contends — for years. “I am an unapologetic drug user,” he writes. “I take drugs as part of my pursuit of happiness, and they work. I am a happier and better person because of them.” He is not, he writes, an addict, and his book is not about addiction. Hart says that his stressful recent stint as department chairman was more damaging to his health than any substance he has ingested.

Marijuana is mostly legal now in a number of states. Taking tiny doses of LSD and other psychedelics to improve mood is no longer a fringe idea. Ecstasy is being touted as an effective treatment for post-traumatic stress. But saying that you take heroin to unwind sometimes, or that bath salts might be employed as a social lubricant for awkward work functions, is unlikely to go over well even in more free-thinking circles.

Of course Hart knows all that. He’s made studying the effects of drugs and our attitudes toward them his life’s work. And he knows that some people will look at him differently now. He writes in the book about his fear of, as he puts it, “coming out of the closet” about his drug use, but at the same time he felt that he couldn’t continue to write and speak about the subject without acknowledging his own experiences. “I know the potential perils of putting yourself in a story like this,” he told me.

Regarding those perils, Hart believes that, as a result of being open about his drug use in recent years, he has suffered professional consequences. There are awards that he believes he might have received — one in particular — but did not. It’s possible, too, that some of his grant applications have been turned down as a result of his candor, though given the closed-door nature of such decision-making it’s hard to say for sure.

Hart’s book has received mostly positive press. He’s been featured recently in *GQ* and *Vice News* and appeared on Joe Rogan’s podcast. *The Wall Street Journal* called the book “provocative and enlightening.” The Ivy-League-prof-snorts-heroin storyline was also picked up by the *New York Post*, which led to some commenters on his Instagram calling him a junkie and saying that he’s encouraging kids to do drugs. For the record, he’s explicitly not giving kids the green light to take drugs (note “Grown-Ups” in the title).

There are a few pragmatic questions that come to mind when a professor publicly acknowledges using using a drug like heroin. One is whether he’s worried about what others at his institution will think. “In terms of colleagues, I

care less about what they think, particularly on this subject, because I’ve been studying drugs for 30 years,” he says. Another is the question of legality: It would be big news if a respected Columbia professor were to be arrested for heroin possession. Hart isn’t terribly concerned about that. “I didn’t say where I do whatever I do, because it’s nobody’s business,” Hart says. “I am very careful and anal retentive and I plan. You don’t get to write all of these books and scientific articles if you aren’t really organized.”

— TOM BARTLETT



Abusive advisers

In MIT's Toxic Ph.D. Culture, a Lifeline

ONE ADVISER expected that a graduate student would always be “on call,” and “knew how to keep us close by threatening our futures.” Another grad student left her program after her adviser told her she didn’t “think correctly”; for a time, she found herself waiting tables instead of studying engineering. A third student’s abusive adviser wrote a negative reference letter, thwarting the student’s efforts to find a better fit in another program.

All three students offered their testimony as part of a campaign by Massachusetts Institute of Technology graduate students to secure transitional funding for those trying to leave an abusive advising relationship. The campaign succeeded: L. Rafael Reif, MIT’s president, recently announced a new program that students and administrators alike hope will put an end to stories like those.

Under the program, which opens on March 9, students in doctoral and combined master’s and doctoral programs at MIT will be guaranteed one semester of adviser-independent funding, which could come in the form of a fellowship, teaching assistantship, or research assistantship. That one-semester period is designed to give students time to secure long-term arrangements with a new adviser or lab, while ensuring they don’t miss a paycheck.

But the program is, more broadly, about redressing a power imbalance between graduate students and their advisers, said Kara Rodby, a Ph.D. candidate in chemical engineering and a co-convenor of the graduate-student coalition behind the campaign. “There is such a refusal to validate students’ experiences as abuse, and instead this behavior — isolating students from other resources, threatening students, having absurd expectations of their time, expectations for falsification of data, horrible safety conditions, etc. — gets chalked up as ‘advising style,’” she said.

That’s why Rodby and Reject Injus-

tice through Student Empowerment — or RISE, as the campaign is known — decided to include transitional funding in a broader list of demands the group issued to MIT administrators last summer.

Administrators welcomed students’ help in creating a more centralized process, said Anantha P. Chandrakasan, dean of the MIT School of Engineering.

“This is almost a perfect template for how the stu-

could present “soft barriers.” Graduate students will be able to request transitional funding through a coordinator in their own department or through the institute’s Office of Graduate Education. Students also won’t be required to present proof of an unhealthy advising relationship to obtain transitional funding.

The policy also prevents a lengthy separation process with a student’s original adviser. While a principal investigator might ask a student to train successors or to finalize data before departing, those obligations will be limited to 15 hours a week of a student’s time for up to four weeks. And if a student isn’t comfortable with handling that wrap-up work, other arrangements can be made.

Students who make use of transitional funding will be offered other safeguards, too, including flexibility around degree milestones and protection from retaliation. For instance, if a student is concerned about asking for a letter of recommendation from the original adviser, transitional-support coordinators will help find other faculty members who can serve as references.

RISE hopes to extend guaranteed funding, in a second phase of the campaign, to students who switch advisers for other, more innocuous reasons — for example, as their research interests change. The second phase will also see the development of a mechanism for tracking adviser switches and of “appropriate responses for troubling patterns and behaviors made evident by” that data.

MIT doesn’t keep detailed records right now of how often and for what reasons students switch advisers. By ensuring support for students considering a switch, Barnhart hopes, MIT leaders will gain a better understanding of how common advising problems are.

“One of the things we don’t know is how many students are not telling us that they’re in that situation,” the chancellor said. “A big motivation here is to empower them to make a change if they feel they need one.”

—MEGAN ZAHNEIS



dents and administration could work together in order to accelerate and achieve our broad goals,” said Chandrakasan, who, with Cynthia Barnhart, MIT’s chancellor, led a working group on the subject, composed of RISE representatives, administrators, and faculty members.

One priority for RISE, Rodby said, was ensuring that students could seek transitional funding through several avenues, not just in their own programs, where departmental politics or a student’s distrust

Readers' Lives Right Now

A YEAR AGO, on March 12, *The Chronicle's* editorial staff gathered in its newsroom, in Washington, D.C., for a hastily arranged farewell meeting. Colleges had already begun moving to remote operations as a result of the coronavirus pandemic, and now it was our turn.

No one was sure how long our retreat from the mothership would last. Has it really been 12 months? What day is today? Absent life's usual milestones, time has defied measure.

What is certain to anyone who has lived through the pandemic is that the losses have been staggering and the psychic toll immense. The arrival of the

vaccines delivers a shot of hope at the same time that some states' premature end-of-the-pandemic decrees inspire frustration, even despair.

Those thoughts and others came through, loud and clear, in response to questions we posed last month to readers of our Daily Briefing and Academe Today newsletters.

We want to continue the dialogue. What else should we have asked? What stories should we be telling? Please let us know, at [chronicle.com/pandemic](https://www.chronicle.com/pandemic). Meanwhile, check out a sampling of what we've already heard.

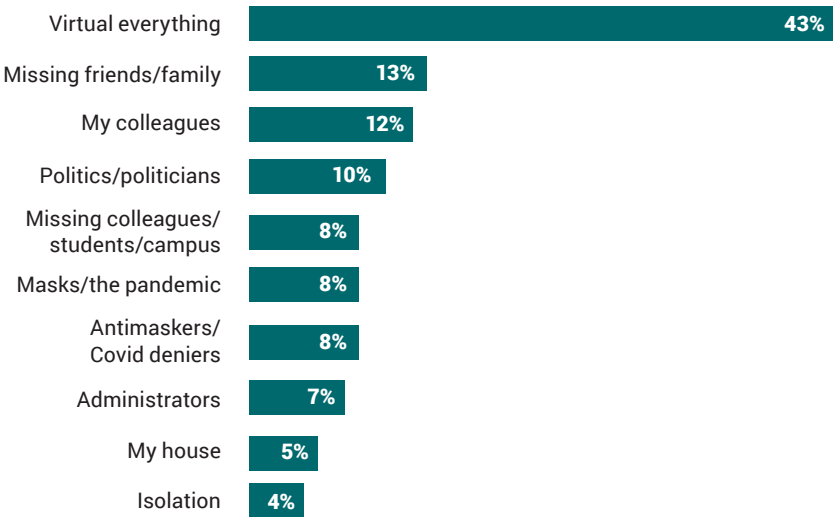
— DON TROOP

What word or phrase should be banned forever?

unprecedented
you're muted • pivot
social distancing • new normal
Zoom fatigue • back to normal • abundance of caution
in this together • flexible

don't be a Karen • herd immunity • next year • asynchronous • meeting • virtual pedagogy • HyFlex • in this space • covidiot • hunker down • lockdown microcredentials • dedensification • customer service • gutted

What are you sick of?



Note: Percentages total more than 100 percent because some readers were sick of many things.

How has the pandemic changed you?

- I am extremely lonely.
- I'm fitter now. I replaced my morning commute with reading *The Chronicle* and other education news and my afternoon commute with a 5-10k run.
- I have worked for a living for the last 50 years. I was laid off in June, and I don't know who I am anymore. What are we without our work?
- I am baking bread regularly. I wear far less makeup. I drive a lot less. I see my family a lot more.
- I am less optimistic now. I am less sure of the survival of higher education.
- I appear to have injured my feet by wearing slippers instead of shoes all these months.

What has the pandemic changed forever — for better or worse — in higher ed?

- No more snow days? Now that we know we can be remote, it doesn't negate the need to shovel two feet of snow or deal with children who are stuck inside.
- We've discovered just how adaptable we can be, but at a terrible human cost.
- I have a feeling that 50%+ of my committee meetings will be online.
- Working at a minority-serving institution, I've seen an increased awareness in how much help students need in order to be successful.
- We will spend years dealing with faculty burn-out and warped career paths, especially for women.
- Students can do internships anywhere in the world remotely, which is really cool!

What do you miss on campus?

- My lunch walks around the campus, where I could see the students playing ball or studying or kissing. Just being young.
- My colleagues, particularly the loud and previously annoying laugh of one of my colleagues.
- Noise. It is hear-a-pin-drop quiet. When someone does come into my office, they often scare me.
- I don't miss anything. I prefer to work from home. This has been a blessing for me. I really wish it could continue on a permanent basis.
- Cooking with students, having them over for dinner or snacks.
- Colleagues, all the books in my office that I can't get to.
- Live concerts and theater and athletics.

A close-up photograph of a person's face, focusing on the ear and cheek area. A hand is visible, holding a light-colored, textured object near the face. The background is a plain, light-colored wall.

‘WE’RE

**BY FRANCIE DIEP,
LINDSAY ELLIS,
AND NELL GLUCKMAN**

A blurred background image showing a person's face and upper body, possibly in a crowd or public setting. The image is out of focus, emphasizing the text overlay.

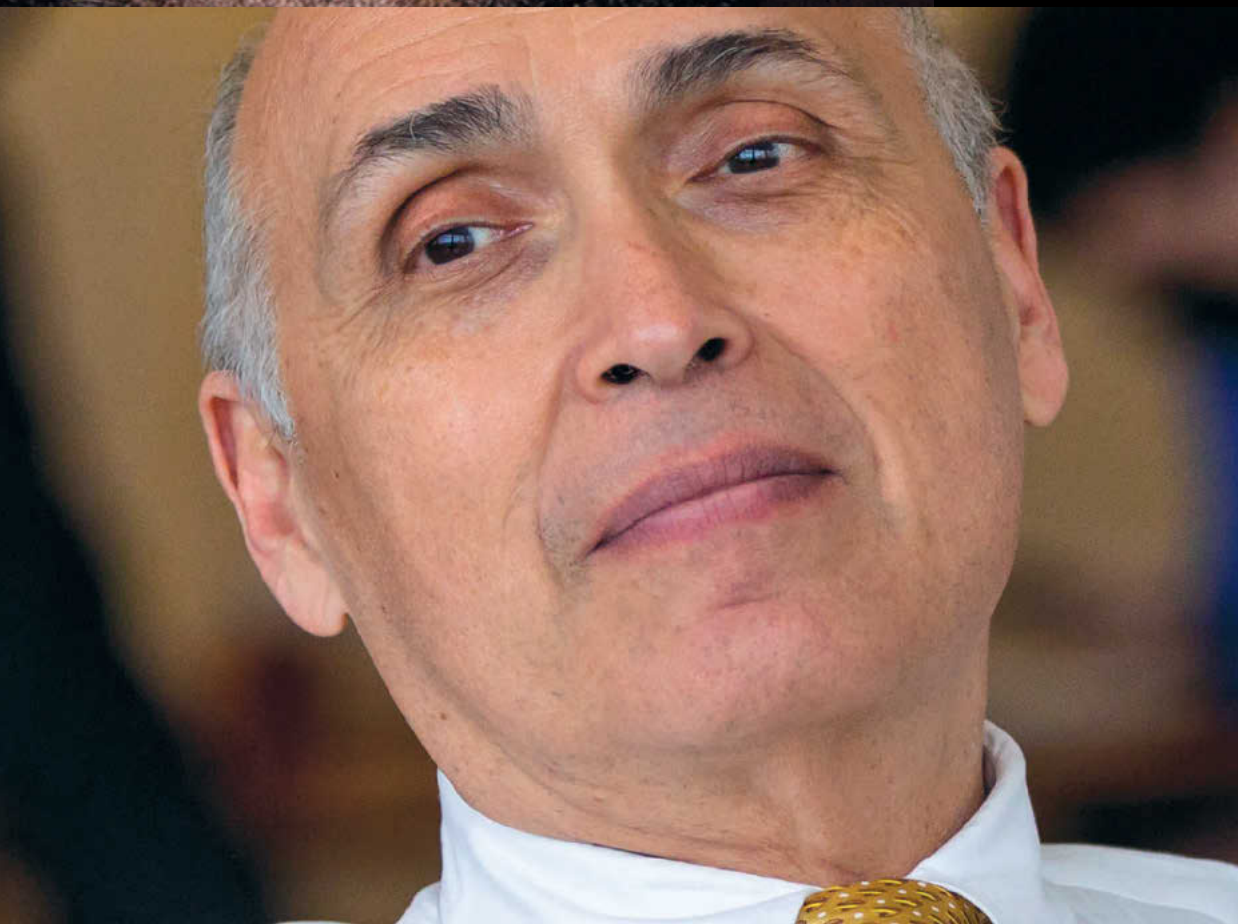
HERE

A close-up photograph of a person with curly hair wearing a leopard print face mask. They are holding the mask with both hands, looking directly at the camera. The background is blurred.

N



PHOTOGRAPHS FROM TOP: LAURA BUCKMAN FOR THE CHRONICLE,
JON L. HENDRICKS, VALPARAISO U., MARVIN FONG FOR THE CHRONICLE



**One year in,
the pandemic
has upended
higher education.**

**A day in these
lives shows how.**

OW,

JEFF AYISIRE woke before sunrise on March 1 with tears in his eyes. He'd had a dream.

In the dream, his younger sister was telling him he needed to stay healthy, to watch his weight. If he were to come down with Covid-19, obesity could make it harder to beat the virus.

Ayisire knew it was true. Stressed and depressed, he'd put on more than 50 pounds in recent months, ever since his sister came back from college partway through the fall semester. But lying on the floor, where he had slept, he felt strengthened and comforted by her words. He was ready to face the day.

The past year has been made of such moments — grappling with a once-unthinkable new normal. One year ago today, the University of Washington took the then-extreme step of moving instruction online and ultimately canceling the rest of the in-person term. That decision ushered in a new reality for colleges. Businesses, schools, and other institutions across the country soon followed.

Since then, the pandemic has left more than 500,000 Americans dead and put millions of people out of work. It has also upended the most minute parts of everyday life.



MARVIN FONG FOR THE CHRONICLE

Noël M. Voltz and her 21-month-old son, Cairo.

To document how profoundly Covid-19 has altered work and life in higher education, *The Chronicle* observed more than a dozen people in the space of a single day — Monday, March 1. For many of them, pandemic life no longer feels new. But their daily lives have transformed. They're filled with unexpected challenges, energizing moments of connection, and devastating loss.

On this Monday morning Ayisire has little time to linger. He and his family have a long day ahead. They are moving out of their home in Arlington, Tex., and today is the final day to get their things into their new place. They owe their old landlord the keys by the next morning.

He skips breakfast and drives to the old house. He sees his mom's room, where his sister would sometimes sleep when she visited. He takes in the memories. And then he begins loading the car.

AT 8:30 A.M., Noël M. Voltz gets a text message from her department chair. He wants her to reach out to a prospective graduate-student recruit to Case Western Reserve University, where Voltz is an assistant professor. Ten minutes later, she trips over a pot that her 21-month-old son, Cairo, dropped on the floor.

"It's a totally normal morning," she says. Then she laughs.

Last May, Voltz moved halfway across the country with Cairo to start a new job at Case. She moved into a house that she'd never seen — bought while she was still a professor at the University of Utah — and started working from home.

Though she met some of her history-department colleagues during her interview before the pandemic, she's never worked with them in person, never been to her office, and set foot on campus only once, to pick up her ID.

After teaching the fall semester and a three-week January term on-

line, Voltz has time off from classes to work on something that hasn't been changed by the pandemic: her unfinished manuscript.

To maintain her focus, Voltz found an at-home day care near her new house. She reasoned that the risk would be low because it's small.

It's not a perfect solution. On Friday, February 26, Voltz had about five hours of meetings scheduled. That morning, she got a text saying the day care would be closed for the day because one of the kids needed to be tested for Covid. Voltz is a single mom. She had no choice but to go ahead with her meetings and laugh it off when her son shoved crackers into her mouth on camera.

But on Monday morning, the day care is open and Voltz is getting Cairo ready so she can work on her manuscript. That means tripping over pots and stepping around strawberries and pancakes that he's thrown on the floor while she prepares his lunch and gets shoes and socks on his feet.

At 9 a.m., Voltz and Cairo are ready to go when she realizes their coats are still in the car and it is parked in a detached garage.

No matter. The weather is already changing, she says. "It feels about, maybe 45, 50," she says as she walks to the car. She looks at her phone. It is 23 degrees.

Cheryl Bickley juggles a different set of responsibilities. It's been nearly a year since she was furloughed from Lynn University, in Boca Raton, Fla., where she researched potential donors for the development office. She was laid off in July.

On Monday morning she's simultaneously filling out forms to find a new mental-health therapist for her daughter, Carleigh, and waiting on Florida's Department of Economic Opportunity website, ready to claim her biweekly unemployment benefit.

Her morning will soon get even busier. She'll need to wake Carleigh and make breakfast. Make sure that Carleigh, who is on the autism

An abstract, vibrant explosion of colorful powder (yellow, orange, red, pink, purple, blue, green) against a black background. A thick orange square frame is superimposed over the center of the explosion.

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CHRONICLE PHOTO BY LINDSAY ELLIS

Deanna Schwartz returns to her dorm room after five days in isolation housing.

spectrum, is logged on for sixth grade over Zoom. Let in the behavioral therapist, who teaches Carleigh ways to calm herself when she gets frustrated.

Finding the behavioral therapist in May was a big win. Bickley had long wanted this kind of therapy for her daughter, but as a single mom working 11-hour days, she didn't have time to find someone. The furlough gave her time. The therapist was 100 percent covered by Bickley's health plan through the university — until she was laid off. Then she had to choose: Give up the therapist, or start shouldering the full price of her health coverage with no paycheck coming in?

"I finally had the opportunity for her to get this therapy and I didn't want to lose it," Bickley says. "What we're living off of right now is my retirement."

DEANNA SCHWARTZ steps out of Northeastern University's isolation dorm moments after the campus bells strike 9 a.m. She balances her backpack, two tote bags, a wheeled suitcase with a flower pattern, and a stuffed black trash bag. The sky is grey, and a light drizzle dots the brick sidewalk. A glass door shuts behind her.

At last.

It was a long five days. But now, on Monday morning, it's time to

less help with responsibilities at home.

"We've had a tough year," José D. Padilla says at a prayer service marking his first day as president of Valparaiso University, a private Lutheran campus.

In the landmark chapel, before its soaring stained-glass windows, he ticks off the challenges. He is moving slowly down the stairs, toward the masked people gathered in person and the empty seats between them.

Before the service, he wondered aloud if he could live up to the moment, of what is expected from a new president. There's a difference between confidence and hubris, he said. In the prayer service, he highlights many people on campus — the students, staff, and faculty with long connections to Valpo — as leaders alongside him.

You are the angels, he tells his new university, who hold a torch to drive out darkness.

"You, you," he says, pointing at two people in the capacity-limited chapel. And then, he points to the camera, where more streamed the service from afar.

Laura Iocin is looking into her computer's camera lens, her portal into the lives of the City College of New York students that she counsels.

It's quiet in the upstairs office in her house in Westchester County. About 50 miles south of there, the counseling center that Iocin leads is empty. But the work has continued at an unrelenting pace. When

leave her bare room and walk the few blocks to her dorm room, with its fuzzy pink rug and map of Baltimore, her home city, on the wall.

Schwartz is leaving quarantine with more than she'd brought in. On Saturday, she learned her isolation would last one day longer than expected, and she had a panic attack. A staff member brought her an extra pillow from her dorm, for comfort. Then there is all the food that Northeastern provided that she didn't eat — cartons of milk, bottles of tea, cereal — some of which she will donate.

Now she's lugging it all back, dragging the black trash bag behind her. The plastic starts to tear. As she walks, the rips widen.

Schwartz gets to an elevator and walks inside. She's finally home. She looks down to see the torn black plastic trash bag, her pillow showing through. Dirt from the sidewalk had smeared the white fabric. "I'm gonna cry."

Similar scenes of misery and frustration have colored campuses for the past year. At many institutions, isolation housing was a routine part of student life. Colleges shed 650,000 jobs in the steepest decline in recorded history. And countless students, faculty, and staff members had more to do and

Students "definitely need us right now. We're seeing a lot of depression, a lot of anxiety."

the pandemic shuttered New York and filled its hospitals last March, City College's students were left vulnerable. The college went remote, and the counseling center gave sessions by phone.

"They definitely need us right now," Iocin says of her students. They work, some have children or care for elderly family members. "We're seeing a lot of depression, a lot of anxiety."

Iocin was thinking about caseloads. There are seven counselors now — three of whom they hired part time with Cares Act funding — plus seven trainees who are seeking clinical experience. In a normal semester, it takes a few months for the trainees' caseloads to fill up. But right now, one month in, only five openings are left.

"We're getting just a little worried about that," she says. "We cannot turn anybody away. We have to meet with every student who reaches us."

She has noticed something else. A lot of students are coming to therapy for the first time because they need to talk about past sexual trauma that was surfacing. The pandemic, she says, has added a layer of stress to people's lives that intensifies other problems. Iocin sits with them over Zoom for 50 minutes. She helps them come up with solutions and sometimes just listens. Virtual counseling has its downsides; Iocin doesn't get to read their body language as they sit in the waiting room or walk into her office — clues that tell her how they're doing. And if they have an emergency, Iocin is miles away.

Counselors are feeling the weight of a difficult year, too. They used to be in one another's offices all the time, checking in, talking about difficult cases. Now they try to recreate that sense of camaraderie in a 30-minute Zoom call in the afternoon.

The pandemic has complicated Iocin's life along with everyone else's. Her young children need attention, and it hurts when they ask for it but she has to work. She hasn't seen the rest of her family since 2018. She and her husband are from Romania and had planned to take their children back there last summer, but now they don't know when they'll visit.

As the morning comes to an end, Iocin looks out the window. Her office is bright and quiet, and she can see the tops of trees. On her desk, two giant, glowing monitors stare back at her.

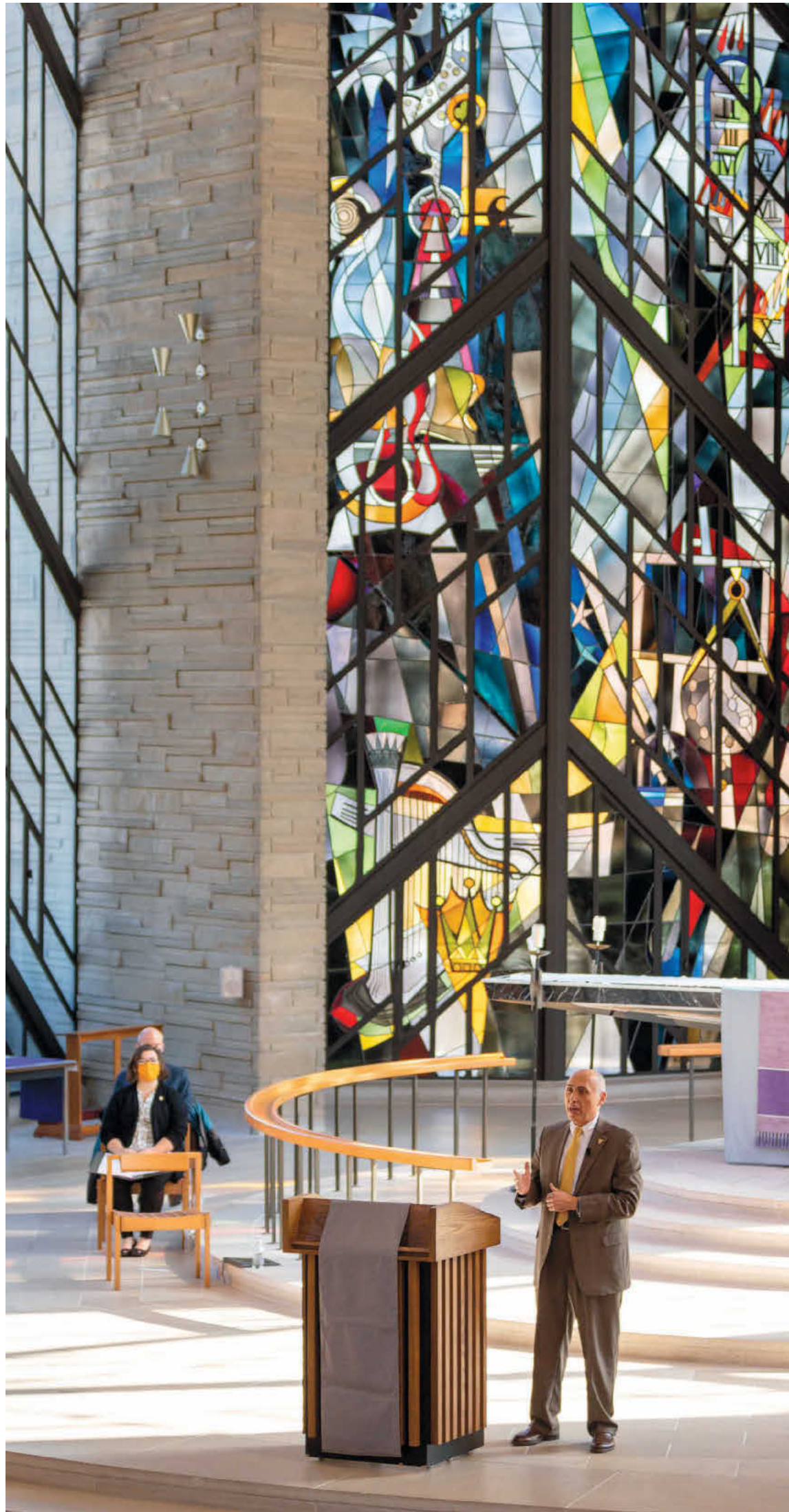
TWO O'CLOCK IN THE AFTERNOON is a dividing line, a mirror in Shernette Lyons's day. It's one of her scheduled breaks. After that, she has to start over, disinfecting the same bathrooms and wiping down the same elevators, doorknobs, and other "high-touch areas" on the fifth floor and basement of Centreville Hall, an eight-story brick dorm at the University of Maryland at College Park. The university instituted the second-cleaning round when it opened for in-person instruction starting in fall of 2020.

Even if a bathroom appears unused, "you have to clean it again," says Lyons, who's been a residential housekeeper at College Park for 11 years. If in a pandemic world many of us feel we're reliving the same day, Lyons enacts that day twice.

This academic year, Lyons has been frustrated to see students gathering in lounges, some of them not wearing masks. Or sometimes several students will get on the elevator with her, which is against the rules, she says. If that happens, she'll get off. Last month university officials blamed small gatherings in dorms for a surge in coronavirus cases, including in halls where Lyons works, *The Diamondback*, the student paper, reported. The outbreaks prompted the university to put on-campus students under a weeklong sequester-in-place order.

The union Lyons belongs to requested N95 masks for housekeepers in May but only recently heard that workers can get one if they ask. Lyons brings her own from home.

"I don't think it's fair for us working with the students in the building," she says. "We have family who have underlying sickness." She has high blood pressure and worries about getting Covid-19, or bringing it home to her husband.



JON L. HENDRICKS, VALPARAISO U.



LAURA SEGALL FOR THE CHRONICLE

Kama O'Connor teaches a college class as her daughter, Isabel, 12, participates in school online.

“Each person finds one other person, and we’re golden.”

Hafsa Siddiqi, a media-relations manager at the university, wrote in an email that the institution had “implemented many safety measures” for staff, including providing non-N95 masks “regularly.” (Lyons said she gets three each morning.) The university’s communications director told *The Chronicle* that federal guidelines do not advise N95 masks for non-healthcare workers.

This is the first Monday since the sequester-in-place order expired, and things are quiet. Lyons hasn’t had any student interactions that made her nervous. Still, she says she and her co-workers are laboring in a “scared environment.”

“Even though I am scared, I still do my job,” she says. “They’re expecting us to.”

People like Lyons assume the risk of the Covid campus. In administration offices and in research labs, leaders try to manage it.

On Monday afternoon, Ana A. Weil and a group of scientists and programmers click into Zoom for a routine meeting to discuss the details of the University of Washington’s formidable Covid-19 testing apparatus.

One year ago, Weil was focused on cholera research. But the university’s decision on March 6 to shift to online learning, which other campuses followed, changed that. She started working on Covid last March when Helen Y. Chu, a colleague at UW Medicine who had quickly pivoted her lab’s focus from influenza to the coronavirus, announced in a faculty meeting that she had funding to test in Seattle nursing homes. But she needed help.

Weil raised her hand. “We tested in the parking lot,” she says. “We tested in the rain.”

Next she was asked to test fraternities and sororities, where there

was an outbreak. Finally, in the fall, the university asked Chu and Weil to design a testing program for the whole university. They’re also studying the data they collect, trying to learn and share how to prevent the spread of the virus at big institutions like the University of Washington.

“This is where you end up a year later,” Weil says. “None of us were doing Covid work a year ago.”

Spring break is coming up. On the Zoom call, Weil and others wonder how they should test students after they return. If they started testing students during the last weekend of the break, Weil says in the meeting, “we would have 7,225, divided by nine, is 802 people a day.” She does some quick math. Not everyone will sign up for a test, so they could allocate 600 tests a day for students. It’s a lot, but no one in the meeting objects.

On the other coast, the afternoon risk-assessment meeting at Benedict College moves quickly. Each department gives an update. Ceeon D. Quiett Smith, the university’s chief of staff, asks questions.

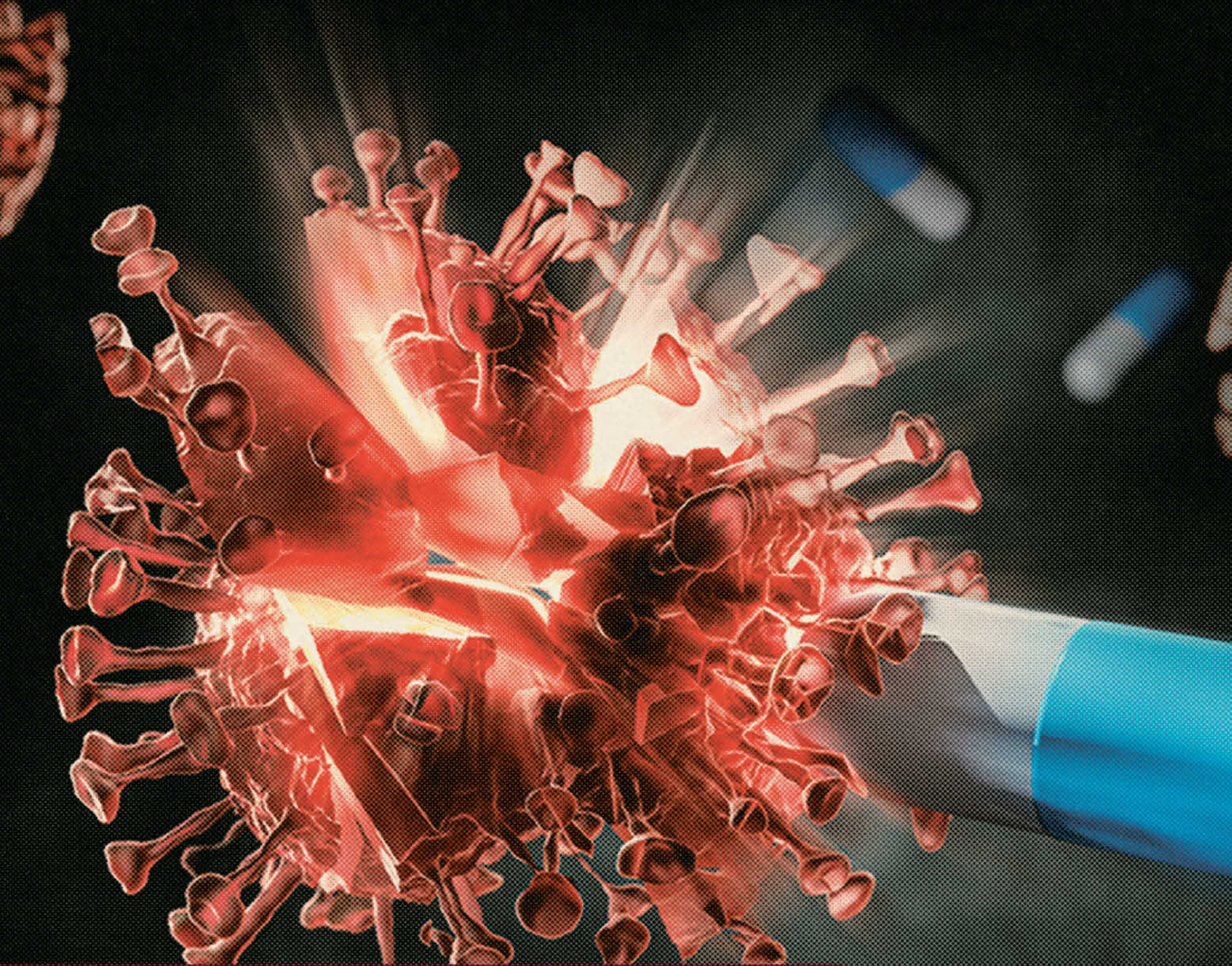
A football tryout will bring high schoolers to campus that weekend. *Yes, they have to show a negative Covid-19 test. Someone from recruitment will pick up transcripts. We need to spray down the restrooms and locker rooms, before and after.*

It’s midterms week, and staff expect high pressure on the IT department and the library. *Is there enough PPE in the academic areas?*

The meeting is nearly over when Gary E. Knight, vice president for student affairs, asks his colleagues to bow their heads. “Let us take a moment and look to the Lord and pause for a few minutes.”

He reminds his colleagues that it is March 1. Almost a year ago, they decided to close the campus and send students home. “God has carried us for a whole year.”

“Think about the persons in your family who are not here now. They’re gone.”



COLLABORATION LEADS TO **INNOVATION**

As the pandemic continues to spread, scientists from the two flagship universities in Texas have teamed up to find a drug to treat COVID-19. Texas A&M University and The University of Texas Medical Branch have found innovation through collaboration, together announcing that a repurposed drug may effectively inhibit SARS-CoV2's entry into human cells. Researchers screened more than 30 drugs and found bepridil, marketed under the brand name Vascor, a medication used to treat heart conditions, showed exciting potential.

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COURTESY TRINITY WOBLER

Trinity Wobler of Northern Ohio U. quarantined in her apartment on campus for a week.

Several people murmured.
 “But we’re here. We were here a year ago. We’re here now.
 “We might fuss on a call. We might fuss at each other. But we worked it out. We’re here. We’re blessed to be here. I can’t thank God enough.”

SIX STUDENTS blink at Kama L. O’Connor as an afternoon introductory composition class — conducted on Zoom — comes to a close. One student has choppy internet. Another uses a digital background. A third has his camera off.

This veterans-only section is a pilot program at Coconino Community College. In O’Connor’s pre-pandemic teaching life, she taught full time with Northern Arizona University’s writing program. But that fell apart in April. She was on a contract, and her boss told her she and her colleagues in composition would not be hired back. O’Connor called her mother, crying.

Then she got to work. O’Connor patched together a teaching load of her own, specializing in working with student veterans.

“Think about the persons in your family who are not here now. They’re gone. But we’re here.”

This spring she mixes classes at Coconino and at NAU’s honors college.

These contingent roles carry uncertainty. What classes will come through for next semester? What about a year from now? On Monday, O’Connor brings that question to her students. After this class, would they want a veterans-only version of English 102? If they could find six more students, that would lock in the class, she tells them.

“If you have friends in a 101 class, or friends who need 102, get them on board,” she says, perched at a standing desk in her kitchen. “Give me their contact info — I can reach out to them. We can find a way to get that class, 102, in the fall.”

“Each person finds one other person,” one student says, “and we’re golden.”

They log off, and O’Connor starts her commute to NAU, where she will teach her afternoon honors-college class in person and online. She and her 12-year-old daughter climb into the car and pull away, blue skies flashing through the windows.

It’s nighttime already in Ada, Ohio, but for Trinity Wobler, time no longer has meaning. “It just doesn’t feel like time exists,” she says. “I feel bored constantly, but my day goes so fast.”

Wobler has spent the past week of her sophomore year at Ohio Northern University quarantined in her on-campus apartment. One day might go by fast, but it feels like a whole season has passed since she went into isolation. When it started, eight inches of snow lay on the ground. Now it’s sunny and warm.

“I just want to go outside so bad,” she says.

Wobler first started feeling sick on a Tuesday night, but she was sure it was just something she ate. By Wednesday night her throat hurt, so Thursday morning she went to the health center. A nurse gave her a Covid test and told her she’d get the results in 45 minutes. They’d email if the test was negative and call if it was positive.

Wobler went back to her apartment and started frantically refreshing her email. “I have never dreaded a phone call so much in my life,” she says.

Forty-five minutes later, her phone rang. Crap, she thought.

Next came an onslaught of instructions about what to do and

questions about who she’d been in contact with. Wobler began quarantine immediately. The university let her stay in her apartment and her roommate went home.

There was no time to prepare for isolation. A friend brought Wobler some groceries. She had laundry to do, but that would have to wait. “Great,” she thought, “now I’m going to have two weeks of dirty laundry.”

Wobler has underlying conditions — asthma and postural orthostatic tachycardia syndrome. On Friday morning, when she woke up feeling pain and

tightness in her chest, a nurse told her to go to the emergency room. There, she had blood drawn and chest X-rays taken. A doctor saw some signs that her heart could be damaged and had her stay the night with the hope that she could get an echocardiogram that weekend.

That didn’t work out. The next day she was released and told to come back for the echocardiogram in a week. By Monday night,

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“It just doesn’t feel like time exists. I feel bored constantly, but my day goes so fast.”

Wobler’s Covid symptoms have improved. But the feeling that time has stopped for her while it keeps going for everyone else is lingering.

“I look outside and I see everybody walking around,” she says. “I’m like, people are still doing things?”

People are still doing things, and it’s getting to Mia Torres. She decides that the next student she sees without a mask, she will write up.

The University of Connecticut’s residential-life office had told resident assistants like Torres that this semester, they should write up residents right away for not wearing face coverings. But Torres still likes warnings, and her hall director trusts the RAs’ judgment.

Sometimes things just happen too fast for her to decide. During

their 10 o’clock round, one unmasked woman walked away swiftly while Torres and the RA she’d been partnered with that night, Tyler Shoban, were warning her. “I feel a little silly calling out from 15 feet away, ‘Hey, stop walking!’” Torres says.

Being an RA has been a difficult balancing act during Covid-19. Administrators still want to see RAs create a sense of warmth and community, or else what’s the point of opening residence halls during a pandemic? At the same time, being on the front lines of policing Covid-prevention behaviors means RAs carry a grave responsibility. “If I slack off,” Torres says, “I don’t want to be contributing to making Covid a lot worse.”

She and Shoban start their third and last round of the night at 11:30, walking through Busby Suites’ four floors. They see a study group they had warned before. This time, two members aren’t wearing their masks. Torres follows through on her resolution. “I was like, ‘Aw, man, we’re going to have to write you up,’” she says.

The students are quiet. They want to know what will happen next. Residential Life will contact them, she says, but she’s been trained not to promise any particular outcome. It’s out of her hands now.



The desk where resident assistants work in Busby Suites at the U. of Connecticut.

MIA TORRES



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LAURA BUCKMAN FOR THE CHRONICLE

Jeff Ayisire, center, and his family members prepare to move out of their home.

**“Lives are at stake.”
If colleges can’t test,
“they need to leave
people online. It’s going
to make things worse.”**

NEARLY 24 HOURS after he awoke from his dream, Jeff Ayisire is still moving his family’s things into their new house. He has made at least seven trips, driving by the local hospital each time.

In their old house, earlier in the day, he swept by the fireplace. This was the room where his sister, Helen Etuk, first isolated when she got sick.

Etuk planned to graduate early from the University of North Texas, which didn’t surprise Ayisire. His sister, an aspiring pediatrician, was driven, with an eye toward saving money. She wanted to be able to provide for their mother.

In the spring North Texas’s president announced the campus would try to reopen more completely for fall. Etuk was excited, Ayisire remembered. She planned to live in an apartment. Her family worried — Etuk had lupus and was immunocompromised — but he said they trusted the university. *If they’re open, they’re proba-*

bly taking the precautionary measures, so no one will catch it, Ayisire remembered thinking. Their family urged her to wear a mask and gloves, and she did.

One day on campus, Etuk was on the phone with her mother, coughing severely, Ayisire said. Etuk came home. Over the following days, she grew weaker, unable to take the stairs. She couldn’t smell a diffuser filled with peppermint essential oil. At the hospital near their house, she learned she had Covid-19, and she stayed there. She

hoped she would get out by Thanksgiving, then Christmas, then New Year’s.

She blamed herself for going back to college, Ayisire remembered. She apologized constantly. He tried to remind her: “It’s not your fault. It’s nobody’s fault. It’s God’s will.”

Months passed. She told Ayisire to be strong, to love God. Hearing that from his younger sister broke him. “I am supposed to be the one to protect you,” he replied. “I’m supposed to be the one to encourage you.”

She died on January 12, weeks before her 21st birthday. To Ayisire, it felt like losing a daughter.

At the funeral, a friend praised her vibrant spirit. Her family began fund raising for a scholarship in her name. In January, days after her death, North Texas urged all students, faculty, and staff to get a Covid-19 test before returning to campus. The campus made some testing mandatory for students later in the semester. Ayisire said he appreciated the step. “Lives are at stake,” he says. If colleges can’t test, “they need to leave people online. It’s going to make things worse.”

Almost immediately after Etuk’s death, her family decided to move farther from the hospital where she died. Ayisire knows moving won’t immediately make things better. It can’t. Easter will come, and his sister will still be gone. Then Mother’s Day, then Christmas. But the distance and fresh start may ease the pain.

Ayisire leaves the old house for the last time at nearly 4 a.m. Tuesday, a full day since he woke up after dreaming of his sister. The rooms are empty, and he leaves behind the key. ■

Francie Diep is a senior reporter covering money in higher education. Lindsay Ellis is a senior reporter covering research universities. Nell Gluckman is a senior reporter who writes about research, ethics, funding issues, affirmative action, and other higher-education topics.

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The Stranded

The pandemic hasn't just disrupted international students' college experience. It has marooned them all over the world.

BY KARIN FISCHER

LILY CAO is dancing in one of Mount Holyoke College's cavernous performance studios, floor-to-ceiling windows casting shadows across the honeyed floors.

Outside the studio, late-winter ice glazes the trees around the Upper Lake, but inside there is warmth and camaraderie, students gently teasing one another for a misplaced step or wrong-footed combination.

Since Lily, a senior, came to Mount Holyoke, ballet has been an outlet for her, a release from the stress of her studies. As the accompanist sits at the piano, Lily stretches her limbs and lets the music envelop her.

Then she wakes up.

She's no longer on the New England campus but back in her childhood bedroom in Lanzhou, a city of three million in west-central China. As Covid-19 spread across the United States last spring, closing campuses, Lily retreated here. Now her dreams, and her computer, are all that tether her to the American college life she had to abandon. Late at night, as her parents sleep, she logs into class sessions.

For all students, the coronavirus pandemic has been enormously disruptive. For the more than one million international students enrolled in American colleges, it has been a vortex, flinging them to every part of the globe.

Some — bound by academic obligations or blocked from returning home by travel restrictions — have remained in the United States. But they, too, are, in a way, dislocated, cut off from the support of family members and longtime friends.





MUSTAFA HUSSAIN FOR THE CHRONICLE

Khuslen (who goes by “T”) Tulga, a sophomore from Mongolia at Hamilton College

The challenges international students face are academic and financial, logistical and mental. Shifting visa policy has left students, both here and abroad, unsettled about their futures. Studying in a language other than their own, often — for those overseas — in the dead of night, compounds the challenges of remote learning. And unable to legally work in the United States, some international students have turned to food pantries to get by.

The acuteness of the problems facing international students led the American College Health Association to single them out as a population made especially vulnerable by the pandemic.

After Lily dreams she is at Mount Holyoke, back in the dance studio, the sadness lingers; it is a stubborn ache not easily shaken. Why am I still here? she sometimes asks her mother.

When students go to America to study, they understand they will straddle two countries, two places, two worlds. The pandemic, though, has marooned them in just one. They are stranded.

TO MAKE one of the most important decisions of her young life, to go to college abroad, Khuslen Tulga had years to prepare. She studied hard, winning a scholarship to a prestigious Mongolian high school that is a feeder to top American colleges. When the admission offers came in, she chose carefully, deciding on Hamilton College, a small liberal-arts institution in upstate New York.

For the other big decision, whether to stay in the United States as a global pandemic flared, Khuslen, who goes by the nickname T, had only hours.

Word of a strange new infection in the Chinese city of Wuhan reached Mongolia, which shares a long land border with China, in early 2020, and T’s family told her the news during calls home. But

the threat seemed remote in America, where T, then a freshman, found attitudes toward illness casual. When she caught a cold that winter, she wore a mask as she would have done at home, but her classmates stared at her strangely. “There’s a saying in Mongolia,” she said, “in a place of the blind, you become blind.” Embarrassed, she took her mask off.

Soon, though, there were Covid cases in the United States. Suddenly, the pandemic was on Hamilton’s doorstep. First, the college ex-

“If I was not hopeful, and if I didn’t recognize that everything’s temporary, maybe I would be in a worse situation than I am now.”

tended spring break. Then, on March 17, David Wippman, the president, announced in-person classes would be canceled for the rest of the spring semester.

T had a choice to make: She could join the queue of students seeking approval to stay on campus. Or she could try to navigate the gantlet of airports to fly home. Doing so would put her at risk of



RETHINKING MENTAL HEALTH FOR THE GREATER GOOD

Since the pandemic's start, the demand for services at Texas Christian University's Counseling and Mental Health Center has nearly doubled. Still, director Eric Wood and his team have not only been able to keep up—they're now seeing even more students per week.

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contracting the virus from other travelers and infecting her grandparents, with whom she lived. That is, if she could even get there — Mongolia had closed its borders, permitting few commercial flights in. If she left America, would she be able to go back? She had worked so hard to get to college, and after little more than a semester, she worried the opportunity could be lost.

Other international students faced a similar calculus, and in the early months of the outbreak, the majority opted to stay. As many as nine in 10 foreign students remained in the United States during the spring-2020 semester, according to a survey by the Institute of International Education.

No single reason kept them here. Few international flights meant many students couldn't book a ticket. Some feared they'd be prevented from returning by visa restrictions and travel bans — such as American prohibitions on travelers from China and, later, from Eu-



COURTESY OF KHUSLEN TULGA

T (left) with her grandmother in January 2019 at their camp, a few hours outside Ulaanbaatar

rope and elsewhere. Those close to earning a degree worried they could lose their chance to work in the United States after graduation, while others did not want to abandon research projects they were in the middle of. The unreliability of local Wi-Fi, internet censorship and firewalls, the difficulty of taking classes from many time zones away — all led students to stay. And many, particularly those studying for graduate degrees, had built lives in America. Departing abruptly would mean breaking leases, pulling kids from school, even separation from American spouses.

For T, the result was agonizing but ultimately clear: She would stay. “I had to just convince my family that it’s better if I don’t move,” she said. “And that was very, very hard to make. It took all of me to make that decision.”

It was a solitary spring. Fewer than 5 percent of Hamilton students had stayed, or about 40 percent of the college’s international students. Although T was one of about 60 students on campus, strict coronavirus protocols meant that she saw little of the others. In her “little dorm bubble,” she registered their presence by the sounds that occasionally seeped through the walls: the melody of someone prac-

ticing the saxophone, the staccato tapping of bongo drums, the murmurs of class discussions on Zoom.

Sometimes, she would put her own classes on speaker and prop her phone up on her desk so that her grandmother, a retired schoolteacher, could listen to the lectures. It was a small grace of the pandemic that T’s grandparents could get this glimpse of her faraway college life, a cracked window they could peer through.

T is close to her grandparents, who raised her after her mother left to find work in California when T was still a toddler. She respects the determination shown by her mother — who taught herself English for the U.S.-visa interview — but she has seen her only once in 16 years, when T arrived in America the summer before college. It was her grandparents who had cared for her all this time, investing their savings in her education when she showed an early appetite for learning.

In lockdown, T would spend as many as four or five hours a day on the phone with her grandparents in Ulaanbaatar, 13 hours ahead. In her free time, she tried to keep busy, drawing, playing the piano, binge-watching TV shows like *Sherlock Holmes*, *Black Mirror*, and the anime series *Hunter x Hunter*. Sometimes, though, the loneliness was too insistent, and she could only cry. Her homesickness, she told herself, was a “nice pain.” It showed how much she loved and was loved.

Colleges have recognized the particular fragility and isolation of international students during the pandemic, and tried to offer them special programming, organizing Zoom happy hours, online game nights, and mental-health support groups. Embry-Riddle Aeronautical University’s campus in Daytona Beach, Fla., even telephoned all of its 1,700 foreign students in the weeks after the virus spread, just to check in.

Within 48 hours of closing its campus, Hamilton had recruited volunteer mentors for each student who stayed behind, a group that included some Americans. Vige Barrie, the college’s senior director of media relations and T’s host mother, regularly dropped off meals from local restaurants, like shawarma kebab, a favorite; together, they took socially distanced walks through the campus glen. T’s boss, Chau-Fang Lin, assistant director in the Office of Institutional Research and Assessment, stopped by whenever she was walking her dogs. The dean of students sent every student a care package with toiletries and Girl Scout cookies.

Before college, T had spent a gap year working with underserved students in the *ger* settlements, traditional Mongolian nomadic communities that frequently lack plumbing or running water. She knew her coronavirus life, while cloistered, was one of comfort and privilege. That helped her rally at her lowest moments, such as when case counts dropped back home, and people were going to concerts, to cafes — freedoms she didn’t have.

“If I was not hopeful, and if I didn’t recognize that everything’s temporary, maybe I would be in a worse situation than I am now, mentally,” she said. “It’s not just international students. Everyone right now is just having a hard time.”

LILY DIDN'T GO BACK to China at first. When Covid struck, she was spending the semester at Harvard University. She had an off-campus apartment and a plane ticket for May. She could wait it out, she figured, until the panic, and maybe even the pandemic itself, had subsided.

Lily, whose Chinese name is Jingyi, felt comfortable in America. She had first come as a high-school freshman, spending four years at a California boarding school before going to Mount Holyoke. Most international students come to the United States for college, but in recent years, a growing number of middle-class students are attending high schools here — because they hope it will better prepare them for an American college or because, like Lily, they prefer it to the education in their home countries.

But something was changing. Stories of discrimination against Asians and Asian Americans, tied to Covid’s origins in China, were growing more common. Since the beginning of the outbreak, the group Stop AAPI Hate has recorded more than 2,800 incidents of anti-Asian bias. The president at the time, Donald J. Trump, repeatedly called Covid “kung flu” and the “China virus.”

As T had before the pandemic, Lily felt self-conscious wearing a



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mask in public, and she was afraid of being singled out. In a grocery store, an elderly woman approached her. *Do you have coronavirus?* she asked Lily. The welcome mat was fraying.

“Covid has really made me scared,” she said. “I just thought that, oh, this could really happen to me as an Asian person.”

As the weather warmed, another shift was occurring. Case counts were coming down in China, the initial epicenter, even as the dis-

Getting back, though, wasn’t easy. Like the United States, China had banned foreign travelers and, for a time, placed severe restrictions on international flights. Lily’s May flight was canceled. She re-booked for June, but that trip, too, was scratched. Finally, her third try, in July, was a success. After a two-week mandatory quarantine in a Shanghai hotel, she made it home.

Such delayed departures are not uncommon. Data from the U.S. Department of Homeland Security show that the number of student-visa holders in the United States fell nearly 25 percent from January, before the pandemic, to December. In a fall survey, colleges told the Institute of International Education that 80 percent of their international students were in the United States, a drop from the spring of 2020.

Being at home with her parents felt a bit like a vacation to Lily. It was the most time they had spent together since she was a young teenager. Every night after dinner and before her classes began, Lily and her mother would take a walk, sometimes along the Yellow River, which winds its way through Lanzhou.

She was also able to reconnect with childhood friends. Because of differences in the Chinese and American academic calendars, their breaks had rarely aligned, and Lily had often spent summer vacations interning in Beijing or Shanghai. They had stayed in touch over WeChat, but now they could hang out.

Soon, though, the excitement of renewing old acquaintances dimmed. Many of the conversations circled back to events that had happened when she was 12 or 13 years old, when they had last been together. That’s not who Lily was anymore. She missed her college friends, the people who knew her now.

Online classes were a disappointment, too. The professors were trying hard, she knew, but remote learning wasn’t the same. A biology major, she was taking vertebrate anatomy. The instructor mailed specimens to dissect to students in the United States;

“I don’t know when I can go home. I’m just thinking about how I don’t even remember what home feels like anymore.”

ease was spreading dangerously in the United States. On WeChat, the Chinese social-media app, parents shared daily statistics about outbreaks in American college towns and strategized about how to get masks and other protective equipment, in short supply in the United States, to their children. In a Pew Research Center poll of people in 13 countries, a median of just 15 percent gave the United States high marks on its handling of Covid.

In Lanzhou, Lily’s hometown, cases were few. She began to feel that she would be safer there.



YUYANG LIU, REDUX, FOR THE CHRONICLE

Stranded at home, Lily Cao takes her dance class at Mount Holyoke online. Though she is physically in China, her life is on Eastern time.

Chapman University Researchers Advance the Fight Against Antibiotic Resistance



New Schmid College Dean Michael Ibba, Ph.D. will continue two decades of research, exploring molecular mechanisms and how cells adapt to different stresses.

Each year, about 2.8 million Americans develop bacterial infections that resist antibiotics treatments. About 35,000 of those patients die – globally the mortality figure is 700,000. Projections are that by 2050, 10 million people will die every year due to antimicrobial resistance, making this one of the world’s biggest threats to health, food security and development.

Research scientists at Chapman University have seen the daunting numbers from the U.S. Centers for Disease Control and Prevention, motivating them to pursue breakthroughs in the labs of the university’s Keck Center for Science and Engineering and the Rinker Health Science Campus in Irvine.

EXPLORING HOW CELLS ADAPT

Joining the overall Chapman team working to combat antibiotic resistance is Michael Ibba, Ph.D., a microbiologist and the new dean of Schmid College of Science and Technology. Ibba arrived at Chapman University this summer from Ohio State University, where he chaired the Department of Microbiology and led a research lab that is moving to Chapman.

He and his team will continue work Ibba started two decades ago, exploring molecular mechanisms and how cells adapt to different stresses. Included in those stresses is the challenge faced by bacteria when confronted with an antibiotic sent to destroy them.

Funded by grants from the National Science Foundation, Ibba’s research has yielded many insights, including nuances in

“Like any other evolutionary process, if you put a challenge in front of cells, it’s adapt or die.”

the behavior of different populations of bacteria.

“Some cells see antibiotics and go to sleep – basically they wait for better times to come,” he says. “This response is known as persistence. If new antibiotics just kill cells that are rapidly growing, the persistent cells will re-emerge.”

As he settles into his new role as dean of Schmid College, Ibba is also eager to get his lab up and running in Chapman’s 2-year-old Keck Center for Science and Engineering, a 140,000-square-foot facility he calls “stunning.” In addition, he’s excited to explore opportunities for collaboration with colleagues in the School of Pharmacy.

“I see great potential for partnerships,” Ibba says.

DEVELOPING NEW ANTIMICROBIALS

At the Chapman University School of Pharmacy, Keykavous Parang, Pharm.D., Ph.D., works alongside his colleague, Rakesh Tiwari, Ph.D., in the lab they share. The team also includes Jason Yamaki, Pharm.D., Ph.D., who works with patients fighting bacterial infections.

Collaboration is critical, Parang says.

“I’m a medicinal chemist who can synthesize a lot of active antibacterial agents, but I benefit greatly from having an infectious disease expert to evaluate further the active compounds developed at my laboratory in the preclinical and clinical setting,” he says.

Team science helps promising research projects escape what Parang calls “the valley of death.”

Potential is turning to progress as the team investigates a new class of antimicrobial agents. This burgeoning area of research is based on peptides, short strings of amino acids with an ability to destroy microbes. They have developed a large library of cyclic antimicrobial peptides (AMPs) that have shown promising activity against several multidrug-resistant bacteria when used alone or in combination with other antibiotics.

Several lead compounds are being evaluated in animal models.

AMPs show promise in countering antibacterial resistance because of their broad-spectrum activities as well as their resilience and stability. They also offer reduced toxicity to host cells. In other words, there’s hope they can be programmed to kill the bad cells and keep the good.

The latest studies from the labs of Parang and Tiwari feature their work on new compounds that include synthesized peptides. The options they prioritize are active against Gram-positive- and Gram-negative-resistant bacterial pathogens and bacterial biofilm production, Tiwari says.

The peptides leak the membrane of bacteria.

“If the peptide can disintegrate the membrane, the bacteria will die,” Tiwari says. “Resistance to these unique peptides takes lots of layers of adaptation, and that can take multiple years, as opposed to regular antibiotics.”

USING PEPTIDES IN COMBINATION WITH EXISTING ANTIBIOTICS

Working with Yamaki and assisted by students with lab training, the researchers modify and optimize new compounds.

Chapman University students will continue to play important roles as the researchers take the next steps with their peptide platform.

“We’ll be looking at synergistic activity with other antibiotics and antivirals,” Parang says. “With a combination of antibiotics, the bacteria have less chance to retain resistance; we can target different events in the life cycle of the bacteria. If they have resistance to one compound, they may still be sensitive to another.”

Research labs like these are important. Because of the costs of shepherding new antibiotics from lab to market and low profit margins as patients were treated quickly, some pharmaceutical companies abandoned developing new antibacterial agents in the 1980s, Parang says.

But that’s changing.

“Large and small pharmaceutical companies are coming back to the effort because of the scale of the problem,” he says. “They know there will be a huge market priority in the coming years.”

This content was paid for and created by Chapman University. The editorial staff of *The Chronicle* had no role in its preparation.

Lily and her classmates overseas made do with watching videos of dissections.

And Zoom couldn't capture the close connections with her professors and other students, the feeling of being part of a community of learners — the very things she loved about American liberal-arts education.

"Taking classes for me right now is opening my laptop, talking to the computer. In the end, the end of class is marked by, close the computer and close Zoom," she said, pantomiming the motions during a video call. "That feels completely different from in-person experiences. Taking online classes at home does not feel like going to school at all."

Mount Holyoke had been wholly remote in the fall, but in November the college announced that as many as 60 percent of the students could come to campus for the spring semester. Lily began to think that maybe she could be one of them.

THAD BEEN LOOKING FORWARD to winter break. Fall had been a grind. To reduce the spread of infection, Hamilton ended classes before Thanksgiving, with professors extending class periods or scheduling Saturday sessions to cover all the material. While T, a computer-science major, had begun the semester taking three of her four courses in person, under tents, cold weather had forced them online. Although most students were back on campus, social-distancing rules made it hard to hang out.

T was exhausted and sick of the four walls of her dorm. "I've been in this room alone for a very long time," she said.

Only about two dozen students would remain behind over the two-month winter break, and Hamilton was putting them up in two extended-stay hotels, in part because the campus would be fully shut down for several weeks. They were excited — in their small quarantine bubbles, they'd be free to mingle. Each of the rooms had a kitchen, and T, who would be a resident assistant, planned to hold cooking classes and game nights. For the group, she designed hoodies, an intricate drawing riffing on the animated movie *Soul*.

Hamilton had offered T an RA position to cover her room and board costs; combined with a full academic scholarship, it freed her from the kind of money worries that many international students have faced during the pandemic. U.S. visa regulations prohibit students from working outside of the college setting, and at many institutions, campus jobs have been hard to come by. The loss of expected summer work back home worsened the financial pinch. Some colleges, such as Michigan State University and the University of Pittsburgh, have created emergency funds to assist international students during the pandemic.

The RA job fit T's personality. Friendly and outgoing, she was happiest when helping others, learning about their stories. Sometimes, she'd randomly knock on doors to make sure no one felt isolated or left out.

When she had come to college, she hadn't thought that being an international student was central to her identity. But in the winter, just as over the summer, most of T's fellow stranded were international students, and she began to feel a greater sense of kinship. International students needed to come together so their voices could be heard, she believed. Through the pandemic, Hamilton administrators had done well by them, but they could do still better, could be

more proactive in communications and better understand their specific needs. With a group of fellow foreign students, T worked to help build up the international-student association.

Still, those efforts weren't enough to crowd out her own loneliness. On New Year's Eve, she video-called with her family and was reminded of all that she had missed out on over the past year: holiday gatherings, summertime camping trips, catching up with old friends. She pined to thumb through her grandfather's collection of Mongolian literature; the elaborate nature metaphors and sense of place spoke to her in a way that English-language authors could not. Sometimes she feared that she was so focused on the present and on the future that her past, that sense of where she had come from, was slipping away.

When would she return? her grandparents asked. She was still only 19, and back at home, she'd be a kid again, her grandparents fixing her meals, telling her when to get up and when to go to bed. On her own, she'd had to grow up; her quarter-life crisis was coming ahead of schedule. That was something she knew she had to hide from her family. Admitting how low she felt would only make them more insistent that she come home. It would compound their worry.

Late one night, T lay in bed, listening to Mongolian songs and scrolling through old photographs. "This isn't the brightest moment of my day," she said, hitting record on her phone.

"I can't speak for every international student, but I feel like this is a feeling that you can't really do anything about. And you just have to take it in and know that it's going to eventually pass away. And I don't know when I can go home. I'm just thinking about how I don't even remember what home feels like anymore."

THE NEW SEMESTER BEGAN, and Lily continued to take classes remotely from Lanzhou. She'd been forced to concede that it wasn't feasible to return. The American ban on travelers from China had still not been lifted, so she would have to fly to a third country and quarantine for 14 days before she could enter the United States. Tickets were hard to come by and cost five times or more what they had before the pandemic. And few of her friends, many of whom were also international students, had gone back to Mount Holyoke.

"It's all about the people that make the place special," Lily said. "And if none of my friends are there, then I

don't think it's worth the energy to travel back."

The decision had at first been emotional, but now she accepted it. She was too tired to feel much, anyway. In the fall, her classes had ended by 2 a.m., but now her school day stretched from 8 p.m. to as late as 5 a.m. because of a particularly intensive immunology course. She slept fitfully during daylight hours, but even on her days off she was afraid to switch her schedule because of the difficulty of readjusting. Her body was in Lanzhou, but she lived in Eastern Standard Time.

For the first time since she had left for the United States, she was home for the Spring Festival, or Lunar New Year. It is the biggest Chinese holiday and one, like Thanksgiving, that emphasizes bringing families together. Lily went to dinner with her parents and grandparents, but she'd had a midterm the night before, and during the meal, she almost nodded off. After dinner, she excused herself and went upstairs to begin classes, the traditional New Year's fireworks sometimes drowning out her Korean-language lessons.



COURTESY OF LILY CAO

When Lily was on campus at Mount Holyoke, she and a friend got temporary tattoos with "MHC" on their arms to celebrate the college's Mountain Day.

As it had been back at Mount Holyoke, ballet was her release. Three days a week, she rolled a portable barre into the spare room where she studied, and balanced her laptop precariously on a stack of books for online dance classes. Because of unstable internet connections, the music would sometimes lag, and Lily and her classmates would find themselves dancing out of sync; other times, her teacher's screen would freeze, and Lily could hear only her disembodied voice, calling out the steps.

Still, she welcomed the discipline of dance and how it could transport her. When she danced, she didn't think about her Covid exile. "I forget everything that's happening around me," she said. "It's really been something that brings me joy and peace."

The rest of the time, though, her life was defined by where she wasn't. During classroom breakout sessions, she'd find herself paired with freshmen or sophomores and feel envious of all that lay ahead of them. They'd get to return to campus.

Lily didn't really mind that she would miss out on graduation, although she felt some regret for her parents, for whom seeing her walk in her cap and gown was a big deal.

Instead, it was the little things that left her feeling lost. There would be no more late-night study sessions over mozzarella sticks and French fries, no more taking the bus to Amherst, Mass., on the weekends, no more stopping off for coffee before early-morning classes. There'd never be another Mountain Day, when the pealing of bells on a day in fall signals an impromptu campus holiday.

And orange chicken. Lily laughed. "When I first came to the U.S., everybody was like, oh, orange chicken is so good. And I said, it is not even a real thing in China. We don't have that dish in China. But now I miss it so much."

Even as she mourned what she was missing, Lily was thinking about her future. She was hopeful that she could start a graduate program, in public health, back in United States in the fall. That hope depended on a lot of ifs — if classes were in person, if American consulates in China began issuing visas again, and, of course, if she got accepted in the first place. Still, Lily allowed herself to think about when — when she would be back in America.

As for T, as the spring semester got underway, she felt some of her winter-break funk begin to lift. She, too, started to think ahead again, making plans for the summer and beyond.

But one thing didn't appear on her horizon: going home. The fog of that uncertainty kept her from even imagining her return.

When she used to dream of going to America, she thought only of the freedom she would have, to study, to live life as she chose. Instead, that choice proved to be a commitment to going it alone. ■

Karin Fischer writes about international education, colleges and the economy, and other issues. She's on Twitter @karinfischer.

REAL IN MORE WAYS THAN R1.



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Science builds the case
for witness memory

Science and learning - the well of optimism

As the months have passed, references to 'our changed world' have almost become clichéd, such has been the long duration of the COVID-19 pandemic. Few people remain untouched by its disruption and tragedies. Without discounting the enormity of the health crisis, there has, in the main, been a positive 'sleeves up' response by people, institutions and industries. The higher education sector in particular has risen to the challenge, keenly aware of its responsibility to equip society to manage the health, social and economic challenges now and into the future.

For the University of Portsmouth, knowledge creation and problem solving are our *raison d'être* and a pandemic brings this into even sharper focus. Our research teams were on the front foot at the very beginning, applying their skills to support the health and wellbeing of people and businesses. This has been a natural extension of our ongoing research and education activities, which we continue to profile in this latest issue of *SOLVE* magazine.

Our mission is to create, share and apply knowledge to make a difference. We are proud to shine light on the groundbreaking achievements of our people and, by extension, the Portsmouth community, which stands globally as a centre of excellence in so many fields of endeavour.

Some of the research covered in this issue spans the full breadth of knowledge pursuit, from the frontier of astrophysics delivering new insights into the cosmos and our place in it and the use of space tools – satellites – for delivering fast, effective disaster response in developing countries, to fundamental human needs; science that tangibly supports physical and mental wellbeing. You will meet in these pages extraordinary people whose ingenuity and services to humanity are inspiring – restoring physical mobility and its attendant mental wellbeing to lives upended by accident or disease; creatively using theatre to help returned service men and women manage the emotional wounds inflicted in today's conflict zones; even using new insights and methods to solve crime.

The University of Portsmouth also has a strong presence, internationally, in environmental science; our research into reducing plastic waste is a benchmark for this worldwide effort. Similarly, resources sustainability is at the core of our research into less obvious, but just as damaging, activity such as the colossal waste in the world's fashion industries.

And did you know that, despite assumptions arising from the sinking of the Titanic, hypothermia rarely causes drowning? Given Portsmouth's maritime history, it is as apt as it is meritorious that busting this myth has led to scores of lives now being saved around our shores every year.

As we ponder an uncertain future, I hope this glimpse into the University and of its people will remind us that learning does not stop. It is why the future offers hope and why science and education are the fount of optimism.



Professor Graham Galbraith
Vice-Chancellor
University of Portsmouth



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COVER PHOTO: 123RF

The University of Portsmouth, like all universities and research institutions, is responding decisively to the coronavirus pandemic. As far as possible, research and teaching have been moved online to limit the disruption to people's work and studies. As we meet this unprecedented challenge we are mindful that our responsibility to the future has never been greater. Research and education will be two crucial bulwarks as the world returns communities and economies to health with confidence.



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The mechanics of wellness

Technology is fixing broken bodies in ways that were science fiction a few years ago.

When serendipity strikes, it tends to have a backstory. Gordon Blunn is known for his pioneering technologies that transform the lives of people suffering loss of mobility through bone cancer, amputation or age-related joint degeneration. His is an extraordinary legacy for a biomedical engineer – and is unlikely to have happened had he remained a marine biologist.

The moment of serendipity that changed his career, and countless people's lives, was the intersection of three chance influences – his belief in the link between physical mobility and emotional wellbeing, a postdoctoral marine biology assignment,

and a job advert for a researcher to solve a medical implants problem.

The postdoc assignment was investigating microorganisms corroding condenser tubes used to cool power stations. The job advert was to investigate the corrosion of titanium medical implants and the build-up of a biofilm that leads to infection ... similar, he mused, to the marine corrosion he was examining.

"So I went for the job, got it, and ever since have sort of diversified a bit," he says.

As he is the 'parent' of three medical device companies, "diversified a bit" is quite the understatement.

As Theme Director of Health and Wellbeing at the University of Portsmouth, Professor Blunn now integrates bioengineering (and the mobility it bestows) with mental health, pursuing his conviction that physical and mental wellbeing are intrinsically linked. It gives musculoskeletal research, sports science and mental health a shared goal.

CHILDREN GROW, IMPLANTS DO NOT
Professor Blunn's awareness of the power of multidisciplinary research is seen in one of his most successful innovations – one that helps children treated for cancer in the long bones of their arms or legs.

To avoid amputation, surgeons remove the tumour while saving a segment of bone to attach an implant. The bioengineering challenge is that tumours tend to occur towards the ends of bones where new growth occurs. Consequently, this means the remaining bone (and its attached prosthesis) cannot grow with the child and so requires repeated limb extension surgery.

Working with the Royal National Orthopaedic Hospital, Professor Blunn invented the JTS Extendible Bone Implant – an ingenious device that replaces extension surgery with a routine trip to an outpatient department. The limb is put through a doughnut-shaped magnet that drives a gearbox to extend the prosthesis.

The device is now so popular with surgeons that the spin-out company established to meet global demand (Stanmore Implants Worldwide Ltd) was recently purchased by Stryker Corporation for £39 million.

TEAM ORTHOPAEDICS


Professor Blunn says the game changer is the ability to link advances from across disciplines: "Engineers are interested in developing new design concepts alongside computer modelling to investigate how implants perform in the body," he says. "Pharmacists are developing new biomaterials. Biomedical scientists research the cellular interactions with biomaterials."

One of Professor Blunn's devices undergoing clinical trials involves integrating human body imaging, 3D printers, biomechanics, biomaterials and cellular biology.

BODY PARTS TO ORDER

The ability to use 3D printers to customise tumour-replacement implants to an individual patient means a better fit, leading to faster recuperation, improved

return of function and fewer long-term complications.

Another project is creating metal implants with a porous surface that imitates bone, right down to the nanotopography. "3D printing means you can print a porous structure. This allows bone growth to integrate and stabilise the implant." Tumour-replacement implants that incorporate these innovations are now being trialled in the UK and Australia. 

Engineers are interested in developing new design concepts alongside computer modelling to investigate how implants perform in the body.

– Gordon Blunn

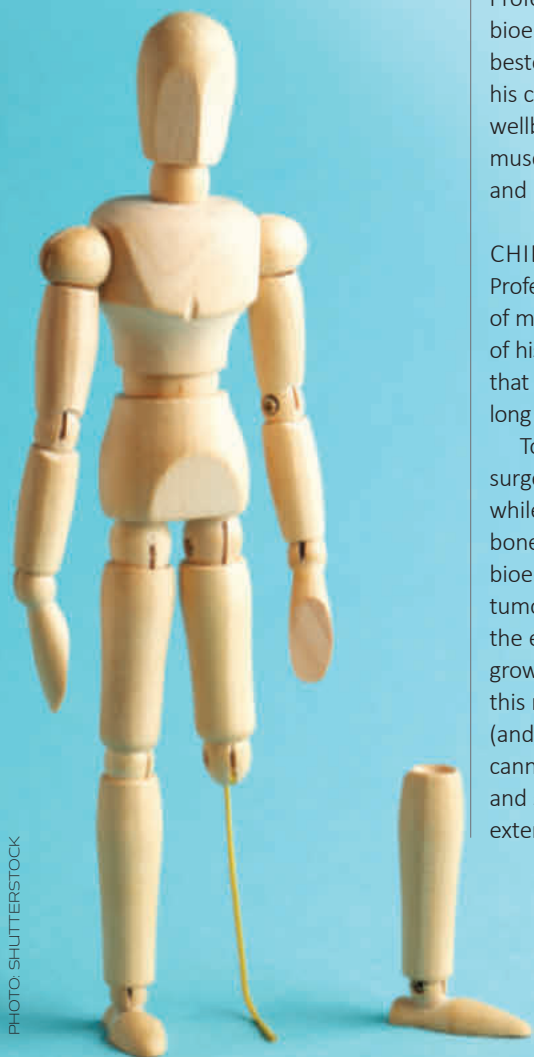


PHOTO: SHUTTERSTOCK



ILLUSTRATION: ADAM NIKLEWICZ/UNSPLASH. SUBMITTED FOR UNITED NATIONS GLOBAL CALL OUT TO CREATIVES

Virus versus human ingenuity

Across the world, researchers from a vast spread of science disciplines have taken on the COVID-19 challenge. They, like the University of Portsmouth's research community, have been a critical behind-the-scenes force bolstering community and industry responses. It has been passionate 'sleeves-up' science that has given hope and confidence for this and future challenges.

STORY BY GIOVANNA BRAIDOTTI

When his father died from a coronavirus-related illness, Dr John Leach experienced firsthand one of several notable psychological impacts associated with the global pandemic lockdown: alienation from the mourning process.

Unlike most people, however, Dr Leach is an expert on the psychology of human survival in extreme environments, including war camps and death camps. This includes familiarity with the toll that isolation takes on the human mind.

He has noted that the impacts of the pandemic lockdown have been similar to those experienced by people in extreme isolation. It was this understanding that allowed him to cope with his father's passing by creating a more deeply personal mourning ritual.

In the same spirit of resilience, Dr Leach joined a large community of University of Portsmouth researchers applying their know-how to fight the COVID-19 pandemic on all fronts: psychological, clinical and epidemiological.

The research community has delivered practical measures, from helping people's emotional wellbeing, to turning 3D printing into a high-speed manufacturing hub for protective medical headgear, and deploying advanced genomics science to track the spread of the virus and provide critical data for vaccine researchers. All of this knowledge and experience is invaluable now and, potentially, even more so into the future.

Dr Leach's professional insights into the long-term mental health impacts of terror, and the attention that researchers such as him have given to COVID-19, also validates the reality of the fear and uncertainty caused by a pandemic. In particular, it highlights the need for long-term community-wide care and mental health awareness.

THE PERSONAL FIGHT

Dr Leach's forte in the battle against COVID-19 is his ability to make sense of the perplexing psychological symptoms encountered by many people under lockdown. This has helped to inform coping mechanisms.

He says the pandemic creates a mental strain by the very fact it forces unwanted and challenging conditions onto people. Such a widescale disruption creates genuine anxiety. Adapting takes a lot of mental energy and given the brain is the body's most energy-intensive organ, people become weary. It is not imagined.

"You have to begrudgingly develop new routines and find ways to cope," says Dr Leach. "That's an energy-intensive process that results in mental fatigue."

He notes a similar loss of energy and motivation among people who work in polar stations in the

Arctic and Antarctic when they go into lockdown over winter. They call it 'winter-over syndrome', which is a form of ennui. Under more extreme conditions – such as returned hostages that Dr Leach has worked with – there is a deeper withdrawal during captivity that causes cognitive disruptions, especially in the ability to think about the future.

He explains that once the shock of capture wears off, people can only think in the present. They gradually acquire the ability to think in the immediate past and then the longer past. But it takes longer to think in the other direction, to the future.

He observed a similar effect during the lockdown and Dr Leach expects people to perk up when they progress through these stages.

"With pandemic lockdowns it's important to keep in mind that the situation is temporary," he says. "As we have seen, there is a coming out of it."

Dr Leach says that if lockdowns become a periodic response to managing this or any future pandemic, an effective coping measure is to find ways to celebrate days that are special for some reason, and to work at imposing routine into daily life. These are small but workable techniques for regaining mental and emotional control.

Dr Emma Maynard of the University of Portsmouth's School of Education and Sociology says this advice is particularly important for children, given their sense of time is more drawn out than adults and needs routine and structure.

"Everything that punctuates children's lives was thrown out the window when schools closed," she says. "Children displaced from schools are one of the groups hardest hit as they struggle to organise their time."

Dr Maynard advises creating structures that include activities to divert children's attention. That can include games, cooking activities, stories and conversation starters that take the attention away from frightening talk of the virus.

BUSINESS SUPPORT

The matrix of research support has been further exemplified by researchers such as Dr Adam Cox, who is beginning the conversation on considering and mitigating the mental health risks associated with the pandemic-driven economic downturn, and Professor Tamsin Bradley, who is applying her experience to inform approaches to minimise lockdown-related domestic violence as more people are working from home. The University's Faculty of Business and Law stepped up to bring its research and practical expertise to help the business sector and the local business community understand not just the evolving challenges, but also the potential solutions and strategies required to deliver business and economic success.

Peter Hooley, Director of Business Development, and David Pickernell, Professor of Small Business

With pandemic lockdowns it's important to keep in mind that the situation is temporary. As we have seen, there is a coming out of it.

– John Leach

Everything that punctuates children's lives was thrown out the window when schools closed. Children displaced from schools are one of the groups hardest hit as they struggle to organise their time.

– Emma Maynard

Enterprise, teamed up to reach out to the business sector early in the pandemic, creating a business survey that identified the evolving challenges faced by business and the long-term opportunities and solutions to ensure a thriving economy.

Through this, the team has accumulated vital data on the business impact of COVID-19, providing an evidence base that has been compiled into a 'big picture' to drive funded activities and chart a path to regional economic prosperity.

"Data on the evolving and emerging business needs of the region will be critical to ensure the community directs its efforts where they are most needed," Mr Hooley says. "It is important for there to be a clear understanding of business needs, challenges and aspirations, and for this to be evidence-based."

Survey findings have been published in a freely available report through the Hampshire and Isle of Wight Local Resilience Forum. The findings have already led to the University delivering 10 online webinars and being awarded more than £700,000 from the UK Government to help improve small and medium enterprise leadership and productivity.

THE VIRUS DETECTIVES

Acquiring a sense of community control over the pandemic has also been critical from morale and medical perspectives. Integral to acquiring this has been the work by Dr Sam Robson at the University's Centre for Enzyme Innovation (CEI). He leads a team of researchers from the University of Portsmouth, working in collaboration with Portsmouth Hospitals University NHS Trust, that redeployed their expertise within the new national surveillance system – the COVID-19 Genomics UK (COG-UK) Consortium.

The surveillance system uses genome sequencing technology, which has come into prominence within the last decade, to quickly and cheaply 'read' the genome of virus particles extracted from thousands of patient swabs.

Dr Robson explains that every time the virus replicates in a human, it does so imprecisely. These mutations diverge as the virus moves through a population, allowing its movement to be tracked with forensic precision, like tracing back a family tree.

As the genomics data accumulates, Dr Robson says, additional benefits become possible.

New computational capabilities (called bioinformatics) make it possible to detect patterns and trends in the overall big data. These allow for correlations between genetic variation in the genome to things such as disease severity, immune responses and vexing issues such as whether people can be infected twice. This understanding then has implications for the development of vaccines and treatments.

"Monitoring how the virus changes over time allows us to understand how it is adapting and

spreading, and the impact that this has on patients,” Dr Robson says. “Being able to monitor the spread of the virus is important, and understanding these changes will be essential in the development of treatment and vaccines. So, using genomics is a strategic attempt to further understand the virus in order to help to track, predict and ultimately stop the spread of COVID-19 globally.”

The University of Portsmouth committed £40,000 to help with the work, in addition to funding from the Wessex Academic Health Science Centre and the UK Government’s £20 million investment into the consortium to study COVID-19.

THE MEDICAL MYSTERIES

Scientific help has also been made available to clinics treating COVID-19 patients. With the virus producing baffling clinical symptoms, such as blood clotting complications, a collaborative network of scientists has made important medical and scientific information on human physiology available to overstretched clinicians.

In one example, an information service called ‘Questions from the frontline’ was created by Mike Tipton, Professor of Human and Applied Physiology at the University of Portsmouth, and David Paterson, Professor of Cardiovascular Physiology at the University of Oxford.

The program allows clinicians to submit questions, comments and data from frontline clinics. The expert panel then mobilises expertise residing within the clinical and non-clinical physiology community on behalf of COVID-19 patients. The service operates as a joint venture between The Physiological Society and the Intensive Care Society.

“The aim is to provide clinicians with an evolving understanding of the physiological and pathophysiological mechanisms that both underpin this disease and determine its outcome and mitigation,” Professor Tipton says. Anyone can access the website to read the questions and responses (physoc.org/covid19/questions) but only clinicians can register to ask questions or comment.

As new ideas are formulated, Dr Simon Kolstoe of the Portsmouth School of Health and Care Professions has made it possible to fast-track obtaining approvals from Public Health England (PHE) to conduct human studies. The process allows for studies that cover both efforts to control virus spread and the quest for treatments that reduce death rates.

Dr Kolstoe’s expertise is in ethics, integrity and governance. He says the initiative provides the responsiveness needed during a pandemic while maintaining ethical standards.

“Research is key for addressing the challenges of COVID-19, but even in a public emergency, research needs to be safe, rigorous and transparent,” he

The team effort across a multitude of projects from the whole University to help tackle the pandemic has been phenomenal. When we come out of the other side of this global challenge we can say, as a University and a community, that we did everything we could to help.

– Ted Turnbull

says. “That’s the standard we maintained with the streamlined system.”

SUPPORT FOR THE FRONTLINE

Other faculties too have found ways to help during the pandemic. In one striking example, Ted Turnbull and colleagues from the Faculty of Creative and Cultural Industries joined forces with the Faculty of Technology, with support from central Research and Innovation Services and Finance teams, to address the initial critical shortage of protective equipment among workers in the healthcare system.

Their first target was the rapid manufacture of face shields to augment and extend supplies of personal protective equipment during a critical shortage at the outset of the lockdown in early 2020.

While initially using 3D printing technology and working with local partners The Makers Guild, the team developed a more rapidly producible shield using laser-cutting technology.

The team created a mini-manufacturing hub able to make in excess of 1,500 shields a day by moving from 3D printing to laser-cutting production processes, which reduced the manufacturing time per shield from one to two hours to just 30 seconds.

More than 2,000 shields were supplied to Queen Alexandra Hospital in Portsmouth and several thousand more to other NHS Trusts to allow their frontline staff to work more safely and confidently. A further 1,500 face shields were provided to Hampshire Fire and Rescue Service and Hampshire Constabulary.

The shield design was created by senior technician John Daltry and is freely available to download at port.ac.uk/collaborate/our-partnerships/laser-cut-face-shields. The team also provided rapid research and development in response to a variety of requests made by the Portsmouth Hospitals University NHS Trust to meet critical needs.

“The team effort across a multitude of projects from the whole University to help tackle the pandemic has been phenomenal,” Mr Turnbull says. “When we come out of the other side of this global challenge we can say, as a University and a community, that we did everything we could to help.”


This is the spirit that motivates colleagues throughout the University, with staff deeming it an honour to play a role matching human ingenuity against a virus that neither knows nor cares for human life. 

ILLUSTRATION:
HAZEM ASIF/
UNSPLASH.
SUBMITTED FOR
UNITED NATIONS
GLOBAL CALL OUT
TO CREATIVES



From frontlines to footlights

The environs of a theatre is helping war veterans tell their stories to the civilian population they would otherwise not connect with, lessening the burden of emotional isolation.



PHOTO: 123RF

This project has two aims – it challenges preconceived notions of military life and encourages veterans and those who are still serving to talk to each other in a safe environment.

– Erika Hughes



When Dr Erika Hughes' brother returned home from Iraq, he – like most combat veterans – struggled to express what he had been through. It worried his family and it was this filial concern that became the catalyst for an innovative and potentially life-saving communication 'bridge'.

Dr Hughes co-developed a form of ethnographic theatre in which ex-service personnel are able to come to terms with their frontline experiences by using the stage as a supportive medium of expression.

Her production, *The Veterans Project*, began running in 2013 in the US and now also in the UK, where she is Academic Lead for Performance in the School of Art, Design and Performance at the University of Portsmouth.

Each year ex-military personnel take to the stage to tell their stories alongside curated video and visual material that supports their narratives.

"This project has two aims – it challenges preconceived notions of military life and encourages veterans and those who are still serving to talk to each other in a safe environment," Dr Hughes says.

The performances help individuals and communities heal the mental wounds of war. Over the years the performers have come from the US Army, US Navy, US Marine Corps, US Air Force, British Army and Royal Air Force, having served in conflicts ranging from Vietnam to Kosovo, Iraq, Afghanistan and the Falkland Islands.

"In an interview situation, and as a non-veteran, I can only ask questions based on my assumptions," she says. "So these answers can't truly explore people's experiences. By getting veterans together, they can talk and we non-veterans can learn."

Veterans gain a lot from speaking on stage, with most finding it cathartic and therapeutic. "The events are clearly facilitating empathy and connection, with the arts functioning as a kind of

community therapy for both audience and performer," Dr Hughes says.

Most performances contain moments of levity, as well as insights into military life. For example, a 2015 performance of *The Veterans Project* at Arizona State University's School of Film, Dance and Theatre revealed military life in the desert involves quite a bit of dancing.


"There's so much dancing in the desert because there's not another thing to do out there," former US serviceman Matthew told the audience. "That's the thing about combat: 99 per cent boredom, 1 per cent being scared shitless."

The performers themselves bring a broad range of perspectives to the project. "For example, in one of the mixed-gender performances, gender itself became a focal point," Dr Hughes says. "One male veteran in an early performance didn't think women should have combat roles. In response, a female veteran also onstage argued that women's gender meant they had to work even harder than their male counterparts to prove themselves in the military."

Many factors influence how the veterans tell their stories on stage. "Memory is fluid. The time that's lapsed since an experience took place can affect the memory or the telling of it. This is just how memory works. In this instance, it's more important to leave a narrative that preserves something.

"Also, perspective counts. For example, veterans might tell their stories differently each time, depending on the audience. It's fair to assume they'll tell the story in one way to their military buddies, and in another way to their grandkids."

Dr Hughes hopes *The Veterans Project* can collaborate with a museum or archive in the future to create a database of military oral histories.

"They will be for historians and people who want to use them to create a better understanding of society, so these important memories are not forgotten," she says. 

Lifesaver in a lab coat

Your boat capsizes, tipping you into water so cold it snatches the air from your lungs, leaving you gasping and instantly panicked. Drowning, too often, has been the tragic outcome. Today, research shows how you can save yourself - even if you cannot swim.

Panic kills, never more terrifyingly than when triggered by plunging unexpectedly into freezing cold water. Panic is the instinctive fight for life; to win, you have to beat not just the threat of drowning but the panic itself – and the clock is ticking.

“Sixty to 90 seconds,” says Mike Tipton, an international authority on the effects of sudden ‘cold shock’ on human physiology and drowning prevention. That is roughly how long it takes for ‘cold shock’ to pass. During this time you must gather your wits and force upon yourself the counterintuitive response to not resist, to defy every instinct and relax and float.

Mike Tipton, Professor of Human and Applied Physiology at the University of Portsmouth, explains how, by getting your breathing under control, you minimise the chance of inhaling water and drowning.

Professor Tipton has spent 30 years researching thermoregulation and environmental and occupational physiology, and more than 20 years working with the Royal National Lifeboat Institution (RNLI) and other lifesaving organisations. He and his team at Portsmouth’s Extreme Environments Laboratory examine people’s physiological and psychological responses to adverse environments.

As anyone who has gone for a bracing swim or had the misfortune of tipping from a boat when fishing or sailing knows, the sea (and lakes) can be shockingly cold. What is known as ‘cold shock’ peaks between 10 and 15°C. The average temperature of UK and Irish waters is 12°C.

In the UK 56% of those that die in water do so within the first few minutes of immersion

Cold shock is the primary cause of death on immersion in cold water

On average, there is an immersion death every 21 hours in the UK

On average one child a week drowns in the UK

But there is a way of behaving that will help keep you safe in the event of an accident.

“Cold water drives your breathing and heart. It also tends to make you thrash around and try to swim hard, even if you can’t swim. That’s the ‘fight or flight’ response ... but it doesn’t work in water,” says Professor Tipton.

Fighting instinct

“It is about fighting that instinct. Rather than swim, force yourself to pause. Then float on your back until you’re able to catch your breath and calm yourself.”

The importance of this is underscored by the lethal dose of salt water inhalation being only about 1.5 litres, less than one large breath – easily achieved in a panic and with the stimulus of cold shock.

The RNLI’s ‘Float To Live’ initiative, part of the Respect the Water campaign, has its origins in research by Professor Tipton, with scores of lives having been saved.

The campaign changed tack in 2016-17 after ongoing research with the RNLI, Surf Lifesaving GB (SLSGB), the Maritime and Coastguard Agency and other water safety organisations showed that half of those who end up in the water do so involuntarily. So the safety awareness message added ‘survive’ to the original ‘respect’ and tried to educate people about what to do once they are in the water.

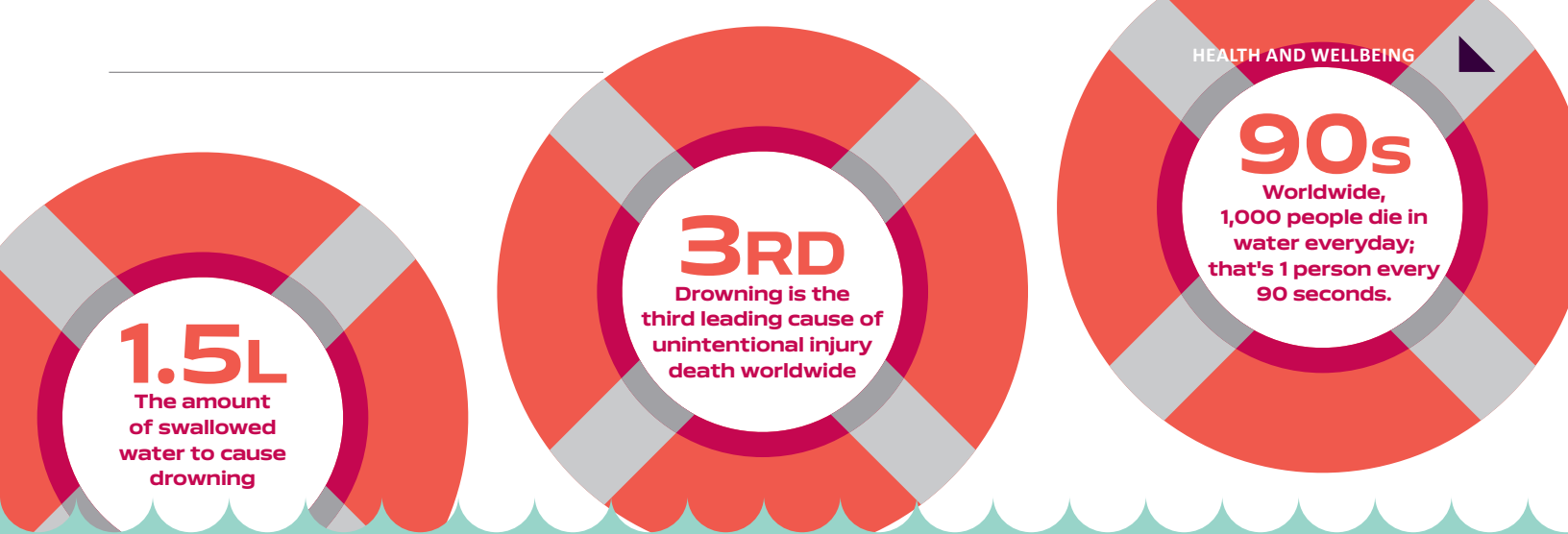
“Float to Live aims to get you over that period where you’ve lost control of your breathing,” Professor Tipton explains.

“If you can float until you get your breathing under control, you’re in a much stronger position to save yourself or be saved.”



ILLUSTRATION: SHUTTERSTOCK

UNIVERSITY OF PORTSMOUTH



Myth busting

As many people, especially if they are not practised swimmers, doubt their 'floatability', in 2018 Professor Tipton and his team conducted a trial with 85 people of different ages, shapes, sizes, genders and swimming abilities. This showed that the vast majority float quite naturally on their back ("even if they think they can't"), aided, if necessary, by some gentle hand sculling.

Another myth debunked was the notion that clothing drags you down: "Quite the contrary," says Professor Tipton. "Clothing can restrict you if you're trying to swim and it's one of the reasons for not swimming if you've gone overboard. But if you stay still in clothing, it traps air and helps you stay above the surface."

However, while humans have natural buoyancy with air in their lungs, there is still a right and wrong way to float. The wrong way is to be upright, which puts increasing strain on the heart and forces air out of any clothing.

"Floating on your back is much less stressful ... you'll still be immersed but your airways will be clear of the water. And the calmer you become, the easier it gets." This message is now being taught in schools in programmes that also teach about rips and tides.

Cause of the cause

Community education aside, a fundamental part of Professor Tipton's research is to investigate 'the cause of the cause' of death, because this also informs safety and sea rescue messages. "It is not enough to say someone has drowned. We need to know the cause of the physiological responses that led to that drowning.

"This not only helps you understand what happened, but also shows where you can mitigate and step in to break the chain that leads from the cause of the cause of death, to death."

One place where this chain can be broken is teaching – or in the case of people who work on the sea, training – how to reduce the panic and subsequent physiological responses to cold water shock.

Not understanding the cause of the cause

Drowning is the biggest killer of sportspeople undertaking their sport

The RNLI Respect the Water Campaign, underpinned by our work, was seen by 46 million people in the UK in 2019

Floating on your back is much less stressful ... you'll still be immersed but your airways will be clear of the water. And the calmer you become, the easier it gets.

– Mike Tipton




of death on immersion has led to fatally flawed assumptions such as the effect, or relevance, of hypothermia.

Professor Tipton says the idea that people die of hypothermia in minutes originates from the sinking of the *Titanic*, but hypothermia takes at least 30 minutes to incapacitate a human adult, even in ice-cold water.

Most cold-water fatalities occur within minutes of immersion, which means there are other factors – in particular cold shock – that lead to panic breathing and the inhalation of a fatal volume of water.

Professor Tipton points to the 1992 crash of a Super Puma helicopter servicing a North Sea oil rig and the deaths of 11 of the 17 people aboard. Professor Tipton investigated the accident after becoming concerned about the lack of detail released about how or why people had drowned trying to escape from the ditched, inverted craft. He noted that all of the safety procedures and the immersion suits being worn were based on protecting people from hypothermia without any consideration of the cause of the cause – cold shock. "The breath-hold time required to get out of a ditched, submerged helicopter cabin is 50 seconds. Physiological studies show that cold water shock gives a person a breath-hold time of only five seconds, but this had not even been considered because the focus was on preventing one cause of immersion death, hypothermia, and not the cause of the cause, which was the real reason people drowned."

Fast-forward to the present day and this is why Professor Tipton's research, put into practice by RNLI, SLSGB and others in the UK and abroad, is saving lives. People are become better educated about what causes death on immersion and how to lessen this risk.

In 2017, coastal drownings in the UK fell by 30 per cent and this was attributed to the Float to Live campaign. Fittingly, in 2018, Professor Mike Tipton became Professor Mike Tipton MBE, awarded the Most Excellent Order of the British Empire for public service for science that saves lives, from lab to lifesaving. 



REACHING OUT TO CHILDREN IN LIMBO

The global COVID-19 pandemic has placed unprecedented strain on already vulnerable children. Dr Wendy Sims-Schouten wants to make sure that children in state care are not written off as 'lost causes'.

In late Victorian times, nearly half of the children with complex mental health problems (regarded at that time as 'mentally deficient children', 'lunatics', and 'imbeciles') and behavioural issues taken into care by the Church of England's Waifs and Strays Society were either deemed as beyond help or 'undeserving' of support. One hundred years later, children with complex mental health needs and behavioural issues, and their families, are still being judged unworthy of assistance – and at only a slightly lesser rate.

Dr Wendy Sims-Schouten, Reader (Associate Professor) in Childhood Studies in the School of Education and Sociology at the University of Portsmouth, discovered this disturbing intransigence while comparing the case files of 108 children taken into care between 1881 and 1918 with the results of 46 interviews with young care leavers and adults between 2015 and 2018.

Dr Sims-Schouten's work has a particular focus on children's mental health within her field of childhood studies, which spans the study of wellbeing, education and sociology and is informed by the disciplines of psychology, sociology and history.

"We still have this narrative that although we like to talk about mental health, we like to support vulnerable children, there is always this group of children who are perceived as 'beyond help', too difficult, too complex, their behaviour is all wrong and they're bad children," she says.

ILLUSTRATION: 123RF



Dr Sims-Schouten is on a mission to stamp out this labelling by training professionals who work with vulnerable children, including refugees, children in care and care leavers, and lobbying for increased support funding.

"If there are not enough resources, if there are not enough practitioners or if there's not enough training, then practitioners also become vulnerable groups themselves because they have to work with limited means," she says.

TRAINING AND RESPONSE

Dr Sims-Schouten cites the case of a young mixed-race girl who had been excluded from school, indicating the school had given up on her. Further investigation revealed she had been acting out behaviour in response to severe bullying.

"I did a number of training sessions with the teachers because it turns out they had not had any diversity or inclusive-practice training," she says. "So together with the Chair of the Racial Equality Council and an ethnic minority representative from the police, we did some training in the school."

When all parties agreed the girl could return to school, the global pandemic hit and education institutions closed, not only cutting off education and that social infrastructure, but also the free school meals that many poor students rely on.

"There was a lot of fear, especially in ethnic minority communities, about going outside, about


getting their food, about being stopped by the police – because we know that a large percentage of black children get stopped and searched by the police regularly – too regularly," Dr Sims-Schouten says.

"And so we did sessions again with the police and the school and we managed to make sure that she could go to school safely to pick up her free school lunch without feeling intimidated by the police presence."

While this is a local example, Dr Sims-Schouten says the failure of child welfare systems is a worldwide challenge.

She has researched and worked in children's care in Greece, Finland, Egypt and Canada. "The issue is about changing practices and creating awareness of what particular children need and also where practice fails," she says.

Recently, Dr Sims-Schouten has been collaborating with colleagues from Jakarta and Surabaya universities in Indonesia, looking at how marginalised and disadvantaged groups there have been affected by the country's lockdown restrictions. These people are usually casual and temporary workers who are not supported by Indonesia's social safety net.

Dr Sims-Schouten says a holistic approach is needed when it comes to the issue of children at risk. "In my case that mostly revolves around providing safety and mental health support, to not accepting superficial assessments of a child being recalcitrant or beyond help and moving beyond Dickensian attitudes." 

We still have this narrative that although we like to talk about mental health, we like to support vulnerable children, there is always this group of children who are perceived as 'beyond help', too difficult, too complex, their behaviour is all wrong and they're bad children.

– Wendy
Sims-Schouten

SLACKTIVISM FLEXES ITS POLITICAL MUSCLE

Is social media bad for democracy? Are people who sign e-petitions signing away their interest in being productive members of society? How do political and campaigning organisations actually use digital platforms? Dr James Dennis steps out into the physical world to analyse how digital politics really works.

Dr James Dennis was undertaking his PhD at the time of England's summer of unrest in 2011 when thousands rioted, looted, burned and fought on the streets. For a socially aware young academic, it was instructive.

"You had the student protests in London, you had occupations in universities around the country. And I saw how very quickly people were using digital tools to mobilise physically and have real impact."

He was witnessing the emerging social and political side of the digital revolution and he decided there and then this would be his field of research. Almost a decade later Dr Dennis specialises in political communication, with a focus on social media and digital news. His research also explores political participation, British citizenship and identity.

His research and position as a Senior Lecturer in Political Communication and Journalism has revealed a gap in the centre of popular discussions around social media and politics: "On one hand are people who see social media as a democratising force, transforming the way we do politics into a more direct form of democracy. On the flipside, we see dystopian accounts of how social media is potentially undermining democracy."

Dr Dennis believes both arguments have some credibility, but he feels the real story is what is happening in everyday life – how social media impacts the way we learn about news, the way we talk about news, and the way in which we participate in political life.

"This includes all the different ways we encounter politics online – from reading a news story to sharing a meme. All of these are political acts, and I argue they



need to be explored together, not in isolation. If you analyse one element in isolation, like e-petitions or Cambridge Analytica, you get a skewed perspective."

Slacktivism arise

One of Dr Dennis' major research projects has centred on a campaigning group, 38 Degrees. He took an anthropological approach, observing the group for three months in its office to understand how it integrates social media into its campaigns.

He then travelled up and down the UK talking to members, seeking to understand whether their engagement went beyond just signing an e-petition and to explore how signing might subsequently impact their views of the given issue.

Dr Dennis' book, *Beyond Slacktivism*, challenges the term 'slacktivist' – a pejorative noun for someone who engages with sociopolitical issues digitally.

The core idea of slacktivism is that online acts, such as signing an e-petition or changing a profile picture to support a cause, have no real impact. What is more, some argue they are dangerous – because the more fulfilled people feel by doing these things, the less likely they are to get involved in 'real' activism, such as street protests or writing to their MP.

Dr Dennis, however, rejects this by regarding participation and engagement as a process, not an isolated visceral reaction.

"I looked at how e-petitions and the use of Facebook and Twitter fit within 38 Degrees' campaign process. I found that it uses social media to get easy feedback from its members in a quick, time-efficient manner.

"It will use the number of likes and shares to understand what its members feel about an issue, and whether it should campaign.

"During a campaign to compel a utility company to pay more corporation tax, the group offered its members a list of different tactics, asked for suggestions, and shared this with members."

While this was interesting in itself as a democratic process, Dr Dennis' real surprise came when he invited members to come together and talk about their campaigns: "I found there were many and substantial differences of opinion, over really important issues – from LGBTQ rights to environmental issues.

"There were climate change campaigners and deniers in the same room, but they were united by a shared enjoyment of membership being on their terms, being able to choose the campaigns they wanted to be involved with and have some influence over the strategies decided on."

For Dr Dennis, findings like this flag a problem with traditional political science. Another research project explored the workings of the campaign organisation Momentum, forged from the movement that helped Jeremy Corbyn secure the Labour Party

leadership in 2015. Momentum was described by former Labour MP Chuka Umunna as "a party within a party, posing as a movement".

Dr Dennis says Momentum's innovation was viral video and organic online sharing, encouraging activists to amplify messages created.

"Supporters and members all said how important those viral videos were in engaging them in the organisation; encouraging them to amplify key messages and get others involved; and creating their sense of collective identity."

Allied to – but not part of – a political party, Momentum is able to operate without the reputational pressures of a party, free to use provocative 'hooks' such as humour and irony, including self-deprecation. A key tactic has been to share clips where Momentum itself is criticised by mainstream political figures as a way of demonstrating its own importance and effectiveness (in the eyes of members and supporters).

But Dr Dennis noticed an interesting disconnect: "What fascinated me was their claim to be a people-powered movement, but their campaign techniques don't allow members to have a say in what messages and policies they prioritise.


"While groups like 38 Degrees use surveys and the number of likes and shares to determine what members think and feel, there was little evidence of such analytics being used to support decisions taken by the central Momentum organisation. Communication officers used social media to task members and supporters to disseminate centrally created content. So it was very much 'controlled interactivity'."

Nonetheless, Dr Dennis says he is "cautiously optimistic about the democratic shortcuts" social media can provide. This is based on observable phenomena: "Yes, you can form connections with politically engaged people on social media, but that doesn't mean you'll be able to change policy, or that all these connections will be for good."

He cites recent examples, including how the 'alt-right' uses 4chan to drum up support for far-right causes in the USA, and how Britain First used meme-sharing on Facebook in an attempt to normalise far-right views in the UK.

Whatever the example, Dr Dennis says it is important to engage with marginalised groups.

"There is a lot to be learned from amplifying voices of people whose perspectives you wouldn't otherwise hear. My next project looks into areas of low social mobility, deprivation, and where young people are the least likely to go to university, to find out how social media shapes their politics."


Dr Dennis hopes this project will reveal ways in which social media could be used to address inequality. Once again, he is sure to find some surprises by exploring areas where traditional political science may not venture. 

On one hand are people who see social media as a democratising force, transforming the way we do politics into a more direct form of democracy. On the flipside, we see dystopian accounts of how social media is potentially undermining democracy.

– James Dennis



ILLUSTRATION 123RF



It is quintessentially human to gaze into a night sky and wonder. It reflects why the human experience has been a journey of endless discovery about ourselves, our planet and what we must do to nurture it. Space technology, today, is the science of astrophysics pushing out the frontiers of raw knowledge, it is humankind's pioneering journeys beyond Earth, and it is the equipping of inner space with satellite platforms to run our modern world. All this ... because we all still wonder.

PAGE 18
Model of
light

PAGE 20
Space technology helping
Earthlings to survive

PAGE 22
Messages
from time

'... HOW I WONDER WHAT YOU ARE'

Laura Nuttall wants us to look into the night sky, put the world's worries to one side, and do what humans have been doing for as long as we have been able - gaze up and wonder.

REPORT BY **BRAD COLLIS**

Laura Nuttall almost missed one of the biggest moments in human science, certainly the biggest moment in her research career. It was September 2015 and a global collaboration to detect gravitational waves was about to resume after a five-year hiatus while the Laser Interferometer Gravitational-Wave Observatory (LIGO) was upgraded to be four times more sensitive.

LIGO detects gravitational waves, or ripples in space-time, by the minute disturbances they make to space and time as they pass through the Earth.

Hopes were high that human science would finally detect what had been, for 100 years, an Einstein theory: that gravitational waves are produced when massive stellar objects such as black holes and neutron stars (dead stars) collide.

Dr Nuttall graduated from Lancaster University having studied physics, astrophysics and cosmology, and completed a PhD at Cardiff University. She is continuing her doctoral research at Syracuse University in the USA and is a member of the LIGO Scientific Collaboration.

PHOTO: J23RF



Dr Laura Nuttall

In 2020 Dr Laura Nuttall was awarded a Future Leaders Fellowship by UK Research and Innovation. The fellowship is to help researchers and innovators become world leaders in their field.

The fellowship will enable Dr Nuttall to further her investigations into different areas of gravitational-wave astronomy. One of the aspects Dr Nuttall will investigate is how changing LIGO sensitivity affects the ability to accurately measure the properties of gravitational-wave signals. She will also develop techniques to overcome periods of poor LIGO sensitivity.

"We want to ensure that key parameters of the gravitational-wave signal, such as the sky location, masses and spins of the source, are unbiased," she says. "This is critical to allow us to point electromagnetic telescopes to the correct sky location, understand the way in which the original binary system formed and measure the equation of state of neutron stars accurately."



1.3 billion light years - the time it has taken for gravitational waves from two colliding black holes to be detected on Earth



Size of a gravitational wave when it reaches Earth - 1,000 times smaller than the nucleus of an atom

Anticipating a busy, stressful period ahead with the resumption of observations, she decided to go camping for a few days. As she walked back into signal range, her mobile phone lit up, and every message was the same. 'Get back. Now. This is happening.'

She needed no further urging: "This was the promise of the theory that would revolutionise astronomy. And I was part of it."

The first signal occurred on 14 September and Laura, who continues her research today through the University of Portsmouth's Institute of Cosmology and Gravitation, recalls how that historic moment was initially dulled by concerns it was not real.

"First we thought someone was playing with us, then we thought it might be false signals to test the new system and I remember my boss wondering whether anyone really would mess around like this just as we were resuming the LIGO program. It took a few days to eliminate all of these possibilities and confirm the signal was real, by which time we had all calmed down and it became very surreal.

"There were people in the group who had been working towards this moment for 30 and 40 years, and of course it all started with Albert Einstein's general theory of relativity in which he predicted there had to be gravitational waves of cosmic origin. It took a century before we had the technology to detect them ... and this was that moment."

LIGO scientists determined that the waves

detected on that day were generated by two massive black holes, known as a binary black hole system, colliding about 1.3 billion years ago – the gravitational waves taking that long to reach us even at the speed of light.

The detection technology has continued to advance and the gravitational waves detected by LIGO (and a sister observatory, Virgo, in Italy) have carried new information and insights into the formation of the universe and the nature of gravity. Physicists had previously modelled the merger of two black holes to produce a single, massive and spinning black hole, but only now can these cataclysmic events be actually observed.

"We're really starting to dig into the binary black hole population and lift constraints from the science of astrophysics. It's an exciting time," says Dr Nuttall, who is Senior Lecturer in Gravitational Waves at the University of Portsmouth.

"One of the first realisations from that first detection was that black holes are much bigger than earlier electromagnetic observations had suggested, and that is already telling us something new about stellar evolution. We have also now observed, for the first time, a neutron star merger."

Dr Nuttall says that a better understanding of neutron stars, formed – like black holes – when the core of a star collapses in on itself, could lead to a better understanding of the nuclear processes of

atoms, which is of direct relevance to science on Earth.

A neutron star is dense – a single teaspoon would weigh a billion tonnes. But a black hole is so dense that even light cannot escape its gravitational pull. “When black holes and neutron stars collide, we think they’ll produce a larger black hole,” Dr Nuttall says.

“Some of the exciting things I see coming in the next few years from this research is getting a handle on how neutron stars and binary black holes form and what the stars that formed these black holes were like.

“In this sense, we are now taking the exploration of stellar evolution into a new era. It’s exciting knowing that so much discovery is ahead of us. In learning more about how stars form, we will be learning more about how we came to be where we are today ... the big questions.”

For Dr Nuttall, that is why astrophysics is important, from a scientific perspective and from a human perspective. She sees it as fundamental

Some of the exciting things I see coming in the next few years from this research is getting a handle on how neutron stars and binary black holes form and what the stars that formed these black holes were like.

– Laura Nuttall

to who and what we are: “We’re explorers. We are intrigued, as a species, and constantly trying to understand what the heck is going on.”

She says astrophysics has the potential to now open up doors to discovery, and comparatively quickly because scientists are now able to study astronomical objects in ways that have never before been possible.

“It might not have an immediate, tangible output, like an MRI machine, but it is important because it is widening our understanding of our place in the cosmos.

“And the more we understand ourselves, the more empathy we have for the world around us and perhaps better appreciate just how lucky we are to exist at all.

“We’ve been going through some difficult times, slogging our way through a pandemic. So it’s nice to have some wonderment in our lives ... to know more about the whole massive universe that’s out there and that somehow we’ve managed to evolve and exist on this one planet.”



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Model of light



PHOTO: SHUTTERSTOCK

Scientists are attracted to questions without answers like moths to a light. It is a perpetual quest because answers lead to more questions - especially when you are trying to unravel the ultimate mystery: our place in the cosmos.

Professor Claudia Maraston sees herself as part of an irresistible continuum, one that began when the earliest humans pondered the night sky and will not end for eons to come, if ever. Her life and work are bound in the eternal questions: What is the universe? How has it evolved? What is its future? Why are these questions being asked by a life form in a remote solar system in a small obscure galaxy in the universe's outer suburbs?

Big questions, shared by many – if not most – people, but as one of the world's leading astrophysicists Professor Maraston has helped prise open some of the universe's secrets that go part way to explaining who and what we are.

Put simply, she explains, we are a product of our home galaxy, the Milky Way, and its carbon and oxygen chemistry. Our Sun and its stellar neighbours have a similar chemical

signature that reflects a specific stage in the universe's evolution – about 10 billion years following the Big Bang.

"Close to the Big Bang, there was no oxygen, just hydrogen and helium. The stars were very bright, much more than our Sun, but without metals they were much bluer. In that situation, biological life like ours was not possible," she explains. "You needed a few billion years of fusion and nucleosynthesis [the formation of progressively more complex atoms] to create the elements that make up our galaxy and which are necessary for us to exist."

This cosmic evolution, the turbulent transition from masses of gas to solid masses on an incomprehensible scale, is a fundamental platform in the science of astrophysics. Some of the key research tools used by astrophysicists and astronomers around the world are stellar population models conceived

and developed by Professor Maraston when she was a PhD student, and which have subsequently been enhanced as computers have advanced: "I developed the first model as part of my PhD. It ran on a small computer, but the models today run on supercomputers."

These models are a theoretical construction of the physical and chemical processes that erupted following the Big Bang and the hydrogen fusion that started the progressive creation of new elements. They help researchers make sense of the data being collected from galaxy observations by providing a research framework for the evolutionary processes that galaxies have undergone over billions of years.

Knowledge building

The never-ending excitement for Professor Maraston is the fact that her models are continually validated, and improved, by the science and the data accrued as observational technologies – including the recent detection of gravitational waves – have advanced.

Along the way, as with any scientist pushing frontiers, she has attracted accolades and criticism in probably equal measure. But it is when she is challenged that she most thrives.

"In astrophysics, you can't fear

challenges. Like all science it has to be a constant debate,” she says. “It’s not a faith. You need to question ... and anything new is going to be questioned even harder because no one has seen it before.

“So you are forced to ask ‘Am I as right as I think?’ This pushes you to further examine your theories ... which is actually good. My model will always be challenged as more data is collected, and I can’t wait. That’s my world. Then one day I will retire and someone else will carry on my work. That’s science.”

Astrophysics combines physics, chemistry and maths. It is not about stargazing through telescopes, but working with big data using supercomputers.

A pioneer in her field, Professor Maraston has advanced humanity’s understanding of what her University of Portsmouth colleague, Professor Bob Nichol (Pro Vice-Chancellor Research and Innovation), calls “the universe’s most complex objects; namely galaxies full of different stars, all evolving differently over billions of years”.

Professor Maraston is studying the biggest galaxies, which seem to have been the first to form soon (about one billion years) after the Big Bang. This is important research because it has been shown that big galaxies are produced by gravitational collapse, but it has also been calculated that there is not enough matter in the Universe for this to be the whole story. The mystery has been ‘parked’ in the theorised existence of ‘dark matter’, something we have yet to be able to see, but know it has to exist.

Professor Maraston’s models assist this research by making sense of light emissions from galaxies that existed billions of years ago. Her lay explanation goes like this: “Suppose you have a row of lamps and you move away from them. At some point you won’t see the individual lamps, just the pattern of the lights. A galaxy is like this. It contains billions of stars. You would never have any chance, with any type of telescope, to resolve the individual components. But what you get is the sum of their light.

“I calculate models that explain the sum of light under different assumptions. Observational astronomers then use my model and compare it with their data. These comparisons give you the physics of the galaxies, an estimate of how many stars they comprise, how big they are and how old they are. The latter is crucial, as this will tell us when they formed in the lifetime of the universe, and therefore their chemistry.”

Time machine

It is this chemistry that makes astrophysics, in effect, a time machine.

The further we look in space, the further back in time we are looking. That is because of the speed at which light travels and the fact the universe has been expanding ever since the Big Bang. Distant galaxies provide a picture of the distant past.



Earth’s home, the Milky Way, was created 10 billion years after the Big Bang



Our Sun is just one of more than 100 billion stars in the Milky Way - and the Milky Way is one of over 100 million galaxies in the known universe



A car ride to the nearest star at 70 miles per hour would last more than 356 billion years

In astrophysics, you can’t fear challenges. Like all science it has to be a constant debate.

– Claudia Maraston

By exploring this history and opening the way for others to pursue their own research using her models, Professor Maraston is taking us closer to understanding the hows and whys of life and the universe.

It is a big subject. “Can it get any bigger?” she quips with the irrepressible humour and candour for which she is known. “I get a headache if I think too deeply.”

This is not helped by astrophysics being in a near constant state of flux – new possibilities opening up, new questions branching off and taking science into whole new areas.

Professor Maraston loves it: “Surprises come every day.”

It is this attitude that infuses her work with a cheerful iconoclasm. She wants to break things constructively and make something better from the pieces. Why? Because she knows we do not have all the answers and she cannot abide complacency.

“In my research I have always tried to push borders and go against the mainstream. I like to do science this way; it’s more fun, it’s more challenging. You can inspire a new generation,” she says. “And you can inspire new science.”

Professor Claudia Maraston

Professor Maraston undertook her PhD in astrophysics at the University of Bologna (Italy), followed by postdoctoral fellow studies at the Ludwig-Maximilian University of Munich (Germany) and the Max-Planck Institute for Extraterrestrial Physics (MPE) in Garching (Germany).

In 2005 she was awarded a Marie Curie Intra-European Fellowship (now the Marie Skłodowska-Curie Fellowship) at the University of Oxford. In 2007 she was awarded a Marie Curie Excellence Team Grant with which she joined the University of Portsmouth as Senior Lecturer, Reader in 2009 and Professor since 2014.

In 2018 Professor Maraston was awarded the Royal Astronomical Society’s Eddington Medal “for investigations of outstanding merit in theoretical astrophysics”. Past luminaries on this honour roll include theoretical physicist and cosmologist Stephen Hawking.



Space technology helping Earthlings to survive

Imagery from space, combined with crowd-sourced information on the ground, is allowing geoscientists to accelerate and improve the world's ability to respond to natural disasters.

In 2017, the Caribbean island of Dominica was in the direct path of hurricane Maria, a devastating Category 5 storm. Dominica's terrain, with nine volcanos running down its centre, has tended to restrict human settlements to where rivers meet the coast. In these locations during the hurricane, people were in extreme danger from the combination of flooding from coastal storm surges and debris flows from the steep terrain.

That people would require assistance was obvious; the problem was how to target aid, given the inability to rapidly assess damage in the circumstances.

However, that is precisely the challenge in disaster management that Professor Richard Teeuw has long anticipated. Over the past decade, he has adapted remote sensing technologies, such as satellite and drone imagery, for use by low-income countries to help mitigate the impact of disasters.

This work is undertaken at the University of Portsmouth's School of the Environment, Geography and Geosciences, within the Risk Reduction and Resilience Research and Innovation Group.

The response of Professor Teeuw's team to hurricane Maria was twofold: assisting with the immediate disaster response and, months later, carrying out a forensic analysis of the disaster 'hotspots' in Dominica.

In the aftermath of hurricane Maria, there was an urgent need for maps showing the extent of damage. Within days of the disaster many volunteers joined a 'mapathon', hosted by the University of Portsmouth, in which they used satellite imagery to map damage

to buildings, village by village. Those damage maps were then passed to the United Nations Office for Satellite Analysis (UNOSAT) to assist the Dominica disaster response.

Funding from the Natural Environment Research Council enabled Professor Teeuw to organise a team of scientists from UK universities to carry out fieldwork, surveying damage to buildings and infrastructure for a forensic analysis of the devastation caused by the hurricane.

"Using photography from drones, we were able to get centimetre-detail of buildings, bridges and roads," Professor Teeuw says. "Because we had associates filming in Dominica earlier that year, we had 'before' and 'after' comparisons that also helped us understand the processes that destroyed reinforced concrete buildings, bridges and other infrastructure."

That understanding has since informed 'Build Back Better' guidelines on how Dominica can rebuild in ways – and in locations – that will be safer in the advent of future disasters.

A similar rapid response occurred in 2020 when tropical cyclone Harold, another Category 5 storm, struck Vanuatu. This time it was radar satellite imagery downloaded from the European Space Agency (ESA) that was used to 'see' through the cloud cover and rapidly detect severe flooding.

In his damage mapping for cyclone Harold, Professor Teeuw was able to use 'cubesats' (each about the size of a shoebox), of which there are now hundreds in orbit providing daily images of Earth's surface.

"Using daily PlanetScope imagery, we were able to examine the devastated islands on the first cloud-free day after the storm. We then mapped damage that would disrupt the disaster response, such as collapsed bridges and landslide-buried roads, and passed those maps to UNITAR [United Nations Institute for Training and Research] to assist the relief efforts."

CONNECTED RESPONSE

This was the connected responsiveness that Professor Teeuw had sought when he established the University of Portsmouth's Crisis and Disaster Management Master of Science course: "I wanted to provide training that went beyond mapping and

GENERAL SATELLITE STATS

Total number of satellites launched into space:

10,000

Number of functioning satellites in space:

2,300

Largest satellites in orbit:

7 tonnes

size of a pick-up truck

Smallest satellites in orbit:

1kg

size of a packet of sugar

assessing geohazards to better communicate that information to emergency managers, reduce the risk of disaster, increase people's resilience and save more lives."

He first pursued this in the 1990s, inspired by the increased availability of free satellite images and free and open-source software (FOSS) for mapping. With other digital mapping enthusiasts, he organised workshops and authored a techniques handbook for the Royal Geographical Society.

From Professor Teeuw's initial interest in developing low-cost digital mapping for researchers with limited funding, he and his team have developed methods of digital mapping, monitoring and modelling that focus on the needs of emergency management and sustainable development in low-income countries.

"The biggest barrier we identified in accessing satellite data and mapping information was what we call 'digital data poverty'. Typically that translates into a lack of internet availability, limiting access to otherwise abundant sources of online information and training for disaster risk reduction activities."

The value of Professor Teeuw's approach was recognised by UNITAR in 2018, when it invited his team to join the CommonSensing consortium. The three-year CommonSensing project, funded by the UK Space Agency, is using satellite imagery to help small island states prepare for – and cope with – the increased frequency of extreme weather events due to climate change.

CROWD POWER

As part of this capability, Professor Teeuw has incorporated the texting and image capabilities of mobile phone systems to provide and receive information, allowing for 'crowd sensing' in which people on the ground provide vital information to the outside world.

"Mobile phones can take a photo, and tag its date, time and location with GPS," Professor Teeuw notes. "We store that phone photo data centrally and link back to the satellite image of that area, creating a link between two types of 'big data': remote sensing from space and crowd sensing on the ground."

Research and teaching activities have developed in line with these applications. A disaster response simulation exercise for the Crisis and Disaster Management Master's course has been developed – in conjunction with Hampshire Fire and Rescue Service – into an international disaster response exercise, the SIMEX. Run annually at locations around Portsmouth, the SIMEX has developed into the largest exercise of its type in the world.

Many emergency response organisations in the UK and internationally are now training their staff and testing procedures and new technologies through the SIMEX exercises.

ENVIRONMENTAL CRISIS MANAGEMENT

Requests for the satellite imaging mapping are growing. For example, satellite radar imagery is being used to peer through the cloud that hovers over Colombian rainforests. Professor Teeuw's team is using radar images from ESA to map and monitor the devastation caused by illegal gold mining and associated deforestation along rivers in the remote Choco region of Colombia. That information – as evidence for legal actions – is passed to organisations working to reduce the impacts of illegal mining through increased policing and prosecutions.

That now extends to using space-based observations to monitor emerging hazards from climate change. "Sadly, crisis management and disaster response are growth industries," Professor Teeuw says.

These kinds of altruistic applications of space technology are also being adopted more generally across society. Examples include providing support for COVID-19 suppression strategies, such as relaying information about crowd dynamics in public spaces.


Funding and support are available for organisations and businesses seeking to incorporate space data into new services through the ESA Business Applications programme, part of the European Space Agency. The University of Portsmouth hosts one of the programme's seven UK regional ambassadors, Tom Greenwood, who works directly with applicants for funding to develop new applications.

Previous funding calls have addressed becoming a plastic-less society, optimising railway networks, accessing cultural heritage and supporting the UN Sustainable Development Goals.

"Not only are we looking to help businesses with this programme, we're also looking to generate much wider socio-economic impacts," Mr Greenwood says. "Space is much more accessible than it ever has been, with more data being generated than ever before, making many more applications possible."

Examples of recent projects include software that uses satellite navigation technology to map routes for cyclists to avoid the most congested and polluted roads, and helping to locate and clean up plastic in oceans.

"Interested organisations can approach ESA with a business case and we can then provide guidance and, in some cases, investment to bring that vision to life," Mr Greenwood says.

"Most people don't realise it, but every day they are interacting with at least 25 satellites. Space is already integrated in our everyday lives in so many ways, but space data may not come to mind when you're coming up with new ideas. There are some great opportunities to integrate satellite imagery and other space data into new innovations. I hope to see the industry continue to thrive in the coming years." 

ORBITING HEIGHT ABOVE EARTH

Low Earth orbit:
1,200 miles.
Mainly used for Earth observation

Medium Earth orbit:
12,000 miles.
Mainly used for satellite navigation

Geostationary orbit:
22,200 miles.
Mainly used for satellite communication





Looking to the immediate future, I think we can better constrain the geological timeline for Mars and put some real radiometric age constraints on when things happened on Mars – when volcanism and impacts happened, when surface water disappeared and intertwining that with the search for life.

– James Darling

Messages from time

As our solar system formed, it left telltale messages about long-ago events frozen into the minerals and structure of rock. Space exploration and meteorites provide opportunities to access these time capsules and the knowledge gained builds our understanding of how and when life formed in our solar system.

Here on Earth, strung along the Orion Arm of the Milky Way galaxy, we are bit by bit coming to know the cosmic order that underlies planetary life. Our solar system is thought to have formed from gravity-driven contraction of interstellar gas and dust into the Sun and planets.

There are, however, periods in this chronology that are murkier than others. Particularly vexing for planetary scientists is a gap covering the first billion years of Earth's history (3.5 to 4.5 billion years ago), when it was evolving the ability to sustain life.

Dr James Darling, who is a Reader in Earth and Planetary Materials at the University of Portsmouth, studies this time period. He says there are answers to be found, but they are hidden within the microscopic features of ancient – and therefore exceptionally rare – rock.

These features can be 'read' using advanced analytical methods to reveal the forces at play during the rock's formation, including the occurrence of massive impact events, the eruption of volcanoes or the movement of tectonic plates.

These time-machine-like glimpses

into a different era are lacking on Earth, unfortunately, when it comes to the period when life first formed. Dr Darling explains why:

"The Earth has been resurfaced and reworked by plate tectonics and erosion throughout its history, so the surface we have today is relatively young," Dr Darling says. "In fact, there are very few places on Earth where it's possible to find rocks that are billions of years old."

Fortunately, this scarcity does not hold true beyond our planet, as researchers learned following the birth of the space age.

"When the Apollo missions to the Moon brought back rock samples, we started to realise those lunar craters and surfaces were very ancient – billions of years old," Dr Darling says. "So, we can look to other planets – and to planetary fragments in the form of asteroids – to understand the forces that created them and learn a lot about the early Earth."

That is precisely Dr Darling's speciality: he works up laboratory methods to analyse billion-year-old fragments of rocks sourced from the Moon, asteroids and Mars. These methods typically involve

using high-energy light, electron and ion beams to probe mineral structures and chemistry down to the atomic scale. He then combines the results with observational data about the geological features of these extraterrestrial bodies.

Given the relevance of this work to issues around the origins of life, Dr Darling also looks for signatures that can weigh in on another vexing question: whether Earth was alone in being able to evolve a biosphere and living organisms.

He undertakes this work in collaboration with space exploration missions or the museums and agencies that curate extraterrestrial samples, including the Apollo materials (whose analysis is overseen by NASA) and meteorites from the Royal Ontario Museum.

The lunar samples continue to reveal the relevance of space exploration to understanding Earth's history, with Dr Darling's group recently discovering that massive impact melt sheets were responsible for forming large portions of the Moon's crust. His team is revving up its efforts and collaborations, with much of the focus shifting to Mars. This is due to the number of missions underway



PHOTO: 123RF

that are exploiting Mars' current orbital proximity to Earth.

At its closest, Mars is about 57.6 million kilometres away, which most recently occurred on 6 October 2020. That proximity was exploited by three separate robotic missions by NASA, the United Arab Emirates and China.

As well as leading ongoing projects studying Martian meteorites, Dr Darling is

involved with the ExoMars mission, which is due to be launched in 2022 during Mars' next approach by the European Space Agency (ESA) in partnership with Russia's Roscosmos.

The ExoMars payload is expected to include a drill designed to collect soil samples to a depth of two metres below the surface to search for signs of life – past or present – with Dr Darling part of the geology team guiding targeting and priorities.

While all these missions will bring about many discoveries – and awe viewers back on Earth – Dr Darling will be standing by, looking to mine the data for clues about Mars' deep past.


The questions that intrigue him most deal with Martian geology that

speaks of a past topography that closely resembled Earth, including the presence of an atmosphere, oceans, rivers and volcanoes.

One key question is why Mars's evolution diverged so drastically from Earth's and what drove that divergence. Another is whether past similarities were sufficient for Mars to have started down the pathway of birthing and sustaining life.

"Looking to the immediate future, I think we can better constrain the geological timeline for Mars and put some real radiometric age constraints on when things happened on Mars – when volcanism and impacts happened, when surface water disappeared and intertwining that with the search for life," Dr Darling says.

"This is my main Martian project at the moment – a £350k STFC [Science and Technology Facilities Council] award to radiometrically date Martian magmatism.

"Because Earth and Mars may have started out similarly, but went down very different paths, this analysis stands to bring about a much better understanding of our own planet's early history." 

From rags to environmental riches

Unseen behind the catwalk lights is a voracious consumer of natural resources. Researchers are hoping to give fashion a makeover that shrinks its appetite.

Textile dyeing is the second-largest water polluter in the world¹ and one pair of jeans takes 2,000 gallons (9,000 litres) of water to produce. It is statistics like these from the United Nations Environment Programme (UNEP) that has researchers urging an industry that spends a lot of time looking into mirrors

to take a closer look at itself.

"The fashion industry needs to change," says Dr Elaine Igoe, Senior Lecturer in Fashion and Textile Design at the University of Portsmouth. "It can't continue operating the way it does."

In fact, the fashion industry is calculated to generate 10 per cent of all carbon emissions globally, and 20

per cent of wastewater. To put this environmental impact into context, these statistics in pre-COVID-19 terms mean fashion was responsible for more annual greenhouse emissions than all flights and shipping combined.

LABEL OF CHANGE

Entering the field to confront this challenge is a new fashion research project, PO1.

Named from the Portsmouth postcode district, PO1 plans to encompass a place-based social enterprise that feeds into the University's Fashion and Textile Design courses. Its aim is to encourage local organisations, students and the community to consider how waste materials can be reused or repurposed – given extended life and value.

"We're working with local organisations, looking at their waste issues and thinking about how we could use some of that waste and create Portsmouth-designed, Portsmouth-made clothing from this material," Dr Igoe says.

The concept of PO1 arose after the Royal Navy and Royal Marines Charity (RNRMC) approached the University asking for ways to reduce waste by creating products made from waste material, which could be sold to raise money.

A former student of Dr Igoe's, Katherine-Jayne Watts, played a key role. In 2019, Ms Watts won Graduate Fashion Week's Sports and Leisurewear Award for a collection made from repurposed materials connected to the sea, including lifejackets and sails. After graduating, she returned to work with Dr Igoe on the charity's challenge.

Ms Watts was intrigued by the design potential of the used life rafts that were going to waste. She was able to deconstruct one raft to create a range of five different trend-led bags, which will be manufactured professionally and sold to support the Portsmouth-based charity.

Dr Igoe says projects such as PO1 help nurture thoughtful, ecologically minded designers of the future. She and her colleagues ask every one of their students to consider where

The fashion industry needs to change. It can't continue operating the way it does.

– Elaine Igoe



Global clothing production has doubled since 2000

85% of textiles end up in the waste system each year

The equivalent of one garbage truck full of clothes is burned or dumped in a landfill every second

Washing clothes releases 500,000 tonnes of microfibres into the ocean - equal to 50 billion plastic bottles - each year

SOURCE: MCKINSEY & COMPANY



PHOTO: SHUTTERSTOCK

their materials are sourced and urge them to choose the most ethical suppliers they can, even when prototyping.

Fashion designers – and shoppers – need to move away from the throwaway fast fashion mindset, says Dr Igoe. The goal should be to create items that consumers will cherish for a long time, pieces they'll be motivated to mend and maintain rather than wear a few times and then throw away.

THE SIGNS ARE GREEN


There are "green shoots of hope", Dr Igoe notes, with some businesses starting to allow customers to return clothes they no longer want to be mended, re-sold or recycled. Some clothing manufacturers are also innovating with biomaterials that are produced in more energy-efficient ways than traditional textiles.

As well as tackling modern fashion's disposability mindset, the PO1 project will work with community groups and organisations, helping to embed and develop practical skills – from deconstruction to design and mending – that support both sustainability and employment.

"Art and design practice has a way of communicating and having impact that can be quite immediate because it's direct and visual," Dr Igoe says. "Creative, practice-based research has a really important part to play in social engagement and impact."

Dr Igoe is keen to collaborate with colleagues in other research fields, such as science and business, to explore ways of reducing fashion's environmental impact.

One example is considering how the use of polyester and plastic-based fibre contributes to the epidemic of microplastics in the world's oceans. Tiny fibres are shed from clothes when they are washed and are too small to be filtered when wastewater is processed. Many of these microfibres end up being digested by fish and other sea life.

Solving the microplastics problem will be far from easy, but exploring ways to tackle it at the source has become a crucial thread in weaving a new approach to how we make and choose what we wear. 

¹Putting the brakes on fast fashion, November 2018, unenvironment.org/news-and-stories/story/putting-brakes-fast-fashion

Pandemic spills into ocean health

Individual and community response to COVID-19 has starkly illustrated the way human behaviour and attitudes towards waste becomes a health hazard for nature.

PHOTO: 123RF

REPORT BY BRAD COLLIS

The detritus of a human pandemic – face masks, rubber gloves and hand sanitiser bottles – dance in ocean currents like schools of phantasmal sea creatures. Billions of single-use plastics produced to combat coronavirus have joined rubbish flowing into rivers and drains that tip into the world's oceans.

Marine life may have been spared the virus, but not its litter legacy. Pandemic pollution will remain an ugly reminder of this human health tragedy for decades.

The waste generated by the world's response to COVID-19 is a telling subtext to a modern-day pandemic. For example, the material of choice for face masks is polypropylene fabric – a plastic.

The mass of waste generated (and captured luridly on social media around the globe) raises the stakes even higher for efforts to rein in plastics pollution, which was already at crisis levels. The response needs science, education and community dialogue – all of which are at the heart of the University of Portsmouth's 'Revolution Plastics' – one of the most ambitious and determined initiatives, locally and globally, to modify the manufacture, use and disposal of plastics.

Revolution Plastics was in planning long before COVID-19 struck, but it was officially launched in late November 2020 when many in the world were already voicing concerns about the pollution being generated.

AGENT OF CHANGE

Revolution Plastics' task is now even greater, but it has at the helm Director of the University of Portsmouth's Sustainability and the Environment research theme Professor Steve Fletcher, an internationally recognised campaigner for change.

"We're experiencing a climate crisis, a biodiversity crisis and a pollution crisis," he says. "These are interrelated and affect our lives through our climate, the food we eat, the air we breathe, and our personal health and wellbeing. The relationship between people and nature has broken down. It has to be repaired. Now."

Revolution Plastics sets out to create a new plastics economy based on improved recyclability, government policy support, and community engagement to achieve systemic change in the use and disposal of plastics. It is part of the University's vision to turn itself and its home community, Portsmouth, into a 'sustainability hub' that will accumulate knowledge, experience and data and be a global model: "It's about transitioning away from unsustainable and polluting practices to a future in which sustainable plastics manufacturing and consumption is the norm," Professor Fletcher says.

Crucially, Professor Fletcher is an adviser to the United Nations on ocean resources and plastic pollution. This places him in a position to network people and institutions, and to combine local community actions with global responses.

After presenting to an OECD/G20

workshop on marine plastic litter, he and colleague Dr Keiron Roberts have been tasked to assess policy options to reach net zero plastics entering the ocean by 2050 under the G20 Osaka Blue Ocean Vision, endorsed by over 80 countries. Their report and recommendations are to be published by the UN Environment Programme (UNEP) in 2021.

Through previous work for the UNEP World Conservation Monitoring Centre in Cambridge, in which Professor Fletcher led a team providing expert evidence to support global agreements to conserve natural ecosystems and combat pollution, he saw firsthand how high-quality science can transform policymaking: “That’s what motivates me to drive Revolution Plastics,” he says.

Professor Fletcher notes there is a rising level of environmental awareness in Portsmouth among groups advocating sustainability, conservation and plastic waste reduction. The University will support this community action by drawing on its leading research and collaborations with global organisations, including the UN, to provide advice and resources to local groups.

LOCAL-GLOBAL-LOCAL

Alliances that establish two-way support between local and global initiatives are already creating momentum and influence.

University of Portsmouth researchers have been awarded £180,000 from the UK Government’s Global Challenges Research Fund for a two-year project to help reduce plastic pollution in developing countries. A team, led by Professor Fletcher and Dr Cressida Bowyer, will work with local communities, businesses and authorities in Nairobi (Kenya) and Sylhet (Bangladesh) to map waste management systems and identify ways to reduce the amount of plastic waste leaking into the environment.

The University of Portsmouth is also part of a £6 million programme to curb plastic pollution in marine ecosystems in South-East Asia. The three-year project, which started in January, brings together researchers, policy groups and community leaders in the UK, Singapore, Indonesia, Philippines and Vietnam.

Closer to home, Netherlands-based The Flotilla Foundation has joined the Revolution Plastics initiative, funding two

projects – the establishment of a global Plastics Policy Hub and a citizen science initiative to tackle urban plastic pollution in Portsmouth.

The Policy Hub will seek to create a global network of governments, organisations, business leaders, researchers, campaigners and the public to drive more accountable ocean plastics policies. The citizen science project is built on a partnership between the University and Portsmouth-based environmental technology company Jetsam Tech. The company has developed an app that allows people to submit photographs of plastic waste they come across. The photos then form a heatmap, revealing when and where plastic waste is building up. University researchers will use the data to better understand plastic pollution in Portsmouth. This will create the evidence base for solutions to reduce plastic entering the environment.

PET EATER ACCELERATES

A key element of Revolution Plastics is the University’s acclaimed engineering of an enzyme that can digest some of the most common polluting plastics, such as plastic bottles made of polyethylene terephthalate (PET), which persists for hundreds of years in the environment. This research has continued to progress, with the team, led by Professor John McGeehan from the University of Portsmouth and Dr Gregg Beckham at the National Renewable Energy Laboratory in the US, having now created an enzyme ‘cocktail’ that can digest plastic up to six times faster than before.

A second enzyme, found in the same garbage-dwelling bacterium that feeds on plastic bottles, has been combined with the initial PETase to speed up the breakdown of plastic. PETase breaks PET back down into its molecular building blocks, creating an opportunity to recycle plastic infinitely.


For the University of Portsmouth and its research teams behind Revolution Plastics, this typifies the science that will steer the Earth away from its unsustainable path. It is inspiring and it is effective, and as the COVID-19 pandemic has shown, when scientists lead, people and governments can be responsive and collegiate for the sake of everyone. 

ILLUSTRATION: 123RF



DATA DETECTIVE PUTS INFORMATION TO WORK

When you talk about security and risk, nothing comes closer to personal welfare than food safety.

Professor Mark Xu knows one secret of modern business success: effective management of the information deluge that floods in via today’s smart technologies and digital devices.

On one level it is all about economic efficiency – enabling businesses to use data more effectively to make better decisions. But in the digital world, ‘big data’ is the new reality that influences everything, including what we put on our dinner plates.

Xu is the Professor in Information Management and Head of Operations and Systems Management at the University of Portsmouth, and the common theme of his diverse research portfolio is data management, especially when it holds crucial information about the traceability and safety of food.

Millions of tonnes of food enter the UK from all corners of the globe, leaving a vast data trail added to at every step of the production and supply chain.

For Professor Xu, there is an urgent need for a system that utilises this data to enable food traceability to combat

fraud and contaminations, which – given the food chain’s globalisation – have the potential to affect every person in every country.

He points to a well-known case in China where chemicals with high protein content are added to milk: “Protein is seen as good,” he explains. “But babies drinking that milk are developing kidney stones because of the added chemicals.”

Professor Xu is now researching the design of a global traceability system that would prevent recurrences of events such as Britain’s 2013 horsemeat scandal, when the nation was shocked to discover that some ‘beef’ products were actually horsemeat.

He says the technology underpinning such a system would store and authenticate information about where a food was produced or grown, how it was processed and how it arrived at the supermarket. This information would be available to consumers in a QR code.


Professor Xu’s interest in data management is as broad as it is deep, and he works closely with companies looking for ways to maximise the opportunities that modern digital technologies offer.

In the UK, he worked with a healthcare company to develop software that increased the speed at which patient data was transferred between hospitals and GP surgeries.

Twenty years ago, his PhD study of more than 200 company managers in five industries revealed that their main issue was lack of awareness of information that was relevant to their businesses. It raised in his mind a key question: “Do they know what problems they could be solving?”

He says the question has not dated and is often at the core of his research.

“Knowing your data and what it holds changes how you manage, respond to or plan ... it can change everything.”

That, he says, is the power that data management can unlock. It can drive digital transformation, strategic planning and exponential efficiency gains, and it can prevent risks to community health and safety being hidden within the deluge of information the globalised world generates. 



Knowing your data and what it holds changes how you manage, respond to or plan ... it can change everything.

– Mark Xu



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The science of questions that cut to the chase

Becky Milne, Professor of Forensic Psychology at the University of Portsmouth, is so widely known as an expert on police interviewing techniques that the producers of *The Bill* sought her input to give their fictional cops authenticity. Back in the real world, she uses her forensic psychology research to advise police, fire services and paramedics on how to question victims and witnesses of crimes, fires and incidents to best elicit useful information.



However, training control room personnel in UK fire and rescue services showed the challenge of dealing with an emergency. Operators, for example, often have to field such calls in 90 seconds, “but, in that time, operatives still have to build rapport with the caller”. Professor Milne and the research team demonstrate how to structure rapport and communication within this time restriction and gather the needed information.

Called in to help British Transport Police

in the aftermath of the 2017 London Bridge terror attack, she was asked to advise on the best ways to interview police personnel – both for gathering information as part of the investigation and to help affected officers handle their own trauma.

The police officers themselves had been collecting information from shaken witnesses and walking wounded. Given the inevitability that most, or all, officers would one day again have to interview other victims of trauma, Professor Milne

provided tools and techniques for gathering information to avoid adding to interviewees’ trauma.

She likens memory to a field of snow that should not be contaminated with the footprints of unnecessary questions.

“Just as we put tape around a forensic scene, I explain that we need to ‘put tape around’ everyone’s head at a scene because it too is fragile, easy to contaminate and needs protecting.

“So we’ve got to be really careful, from the frontline all the way to court, about keeping that snow as uncontaminated as possible.”

Professor Milne has run advanced interviewing training programs around the UK and abroad. She has evaluated police interview techniques for the Home Office and has helped to write the national guidance document ‘Achieving best evidence’, which sets out the best ways, for legal purposes, to interview vulnerable groups, such as abuse victims.


She has also worked on devising interview strategies for major incidents including terror attacks and, together with Dr Kevin Smith of the National Crime Agency, wrote the national guidance document ‘Witness interview strategy for critical incidents’. It is now being trialled and used in other countries, such as The Netherlands, highlighting the global relevance and challenge for interviewing and investigating techniques in today’s often complex criminal scenarios. 



ILLUSTRATION: 123RF

Just as we put tape around a forensic scene, I explain that we need to ‘put tape around’ everyone’s head at a scene because it too is fragile, easy to contaminate and needs protecting. So we’ve got to be really careful, from the frontline all the way to court, about keeping that snow as uncontaminated as possible.

– Becky Milne

Justice takes a memory trip

Justice can be a rickety structure when it relies solely on memory. New research is developing more reliable investigation and interview 'tools' to shore up this fundamental feature of the legal process.

When detectives in Dallas solved a 20-year cold murder case in early 2020, the celebrations rippled across the Atlantic. Needing verifiable evidence connecting the suspect to multiple murders over many years, the detectives drew a comparatively new UK-developed interview technique into their approach to obtaining information from the suspect.

Called the Timeline Technique, this interview format moves away from the conventional question-and-answer approach and instead requires witnesses to complete a detailed timeline of events. The process reduces reliance by investigators on 'story' narratives that gloss over details and place a heavy burden on interviewees' memories and on the choice or nature of the questions asked. In empirical tests, the Timeline Technique has been found to elicit a more complete and accurate chronicle of events.

The Timeline Technique is part of an innovative set of interviewing and information elicitation tools developed in the UK and informed by psychological science. Another example is the 'self-administered interview' (SAI®), developed by Lorraine Hope, a Professor of Applied Cognitive Psychology at the University of Portsmouth, with Fiona Gabbert (Goldsmiths, University of London) and Ron Fisher (Florida International University).

The technique is essentially a set of structured questions that witnesses complete by themselves. It was designed to help police capture the immediate memories of eyewitnesses to incidents in

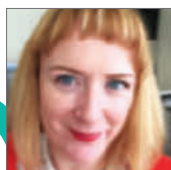
public spaces, such as terrorist attacks or other mass incidents.

"It prompts for all the details," explains Professor Hope. "Then, it probes for information about the people who are involved, who else was present, were vehicles involved, what were the conditions under which you viewed, and so on."

Professor Hope's psychology research has come to have a direct impact, both in the UK and internationally, on how law enforcement now gathers evidence. It is an achievement recognised by the International Investigative Interviewing Research Group when it awarded her the 2019 Award for Academic Excellence.

It prompts for all the details. Then, it probes for information about the people who are involved, who else was present, were vehicles involved, what were the conditions under which you viewed, and so on.

— Lorraine Hope



SUPPORTING WITNESSES

Professor Hope's work addresses real-world challenges relating to "memory at the sharp end", when witnesses – including victims, emergency services personnel and passers-by – have critical information needed by law enforcement.

"Memory is not like a video recorder," she points out. "Physical and psychological demands take their toll on a person's cognitive resources – as well as factors

such as having to make decisions and responses quickly. This means that crucial information may not always be optimally encoded. At other times the information is encoded, but witnesses need help to retrieve it from memory."

MEMORY IN DYNAMIC ENCOUNTERS

In other research aimed at assessing the effect of psychological stress on memory, Professor Hope monitored heart rates in pairs of police officers – one responding to an increasingly agitated armed offender threatening hostages and officers, and the other officer observing the simulation. Afterwards, both officers had to give detailed accounts of what had happened.

The active responder had a significantly higher heart rate and recalled significantly less correct information about the incident compared to the observer.

Almost 20 per cent of participants in this study recalled the offender pointing

a gun at them – something that never happened. This illustrates an interesting and naturally occurring memory error.

HELPING WHEN RESOURCES ARE LIMITED

The SAI® provides police with additional options for obtaining reliable information from multiple witnesses at a crime scene.

In one of Professor Hope's case studies, Greater Manchester Police helped test the SAI® after a chaotic road accident in which a speeding motorbike rider had crashed into a car, killing himself and landing his two pillion passengers in the path of an oncoming bus.

The first police officers on the scene identified eight key witnesses, to whom they spoke immediately. They took the names of another eight people who, under normal circumstances, would have been interviewed later. On this occasion, these witnesses were given SAI® forms. The feedback from police was that this saved them considerable time and helped them to identify three more eyewitnesses with useful information.

"Over time, your memory decays," Professor Hope says. "So witnesses will be losing information from memory, such as valuable, specific details about what they saw. There's also time for the memory to become contaminated, perhaps by new

Assisting national security

Lorraine Hope, Professor of Applied Psychology at the University of Portsmouth, works closely with the Centre for Research and Evidence on Security Threats (CREST). CREST is a national hub for security research, funded by the UK's security and intelligence agencies through a grant administered by the Economic and Social Research Council. Its mission is to deliver a world-class, interdisciplinary portfolio of activity that maximises the value of behavioural and social science research to understanding, mitigating and countering threats to national security. Professor Hope's Timeline Technique has been recognised for its effectiveness in obtaining more information than is generally gained from a conventional question-and-answer session. A CREST impact review cited this new technique as having provided greater insights into national security issues, including information relating to recruiting techniques and locations used by a terrorist organisation.

In 2020, CREST awarded Professor Hope funding to identify the best techniques for getting information about security threats from online sources, with a focus on building rapport and communication strategies.

► crestresearch.ac.uk

information about the incident appearing on the news, or false information being spread on social media."

The SAI® now forms part of the College of Policing's recommendations for obtaining initial accounts from witnesses in England and Wales. It has been translated into numerous languages and adopted either for use or in trials in Europe and internationally. The SAI® has also been adapted for use in digital and online formats, while versions for other investigative contexts have also been developed including, most recently, a version to assist with missing persons investigations.


"In psychology, we ought to be able to deliver better tools and techniques for police to provide the best possible accounts of what happened, informed by objective science. There is no judgement in this – it's all about the evidence," says Professor Hope. 

ILLUSTRATION: SHUTTERSTOCK

Lessening THE RISK OF nature's fury

Dr Carmen Solana is a volcanologist who comes from a unique standpoint - she was born in a volcano. Today, her research aims to reduce the devastating impact of natural disasters on communities around the world.

The volcanic eruption in New Zealand's White Island that killed 21 people in December 2019 brought into sharp relief the work of volcanologists in trying to forewarn of such natural catastrophes and to limit the devastation.

For Dr Carmen Solana, Reader in Volcanology and Risk Communications at the University of Portsmouth, the White Island tragedy demonstrated the enormous, deadly power of an eruption that, despite monitoring, can still occur without warning.

Dr Solana's particular area of expertise is the threat to life and property posed by lava flows – the primary challenge for civic authorities following eruptions in recent years in Hawaii, Sicily and Japan.

This becomes an unceasing management

challenge. Lava never follows the same path from one eruption to the next, so hazard and vulnerability maps need regular updating.

"In places that have frequent eruptions, like Sicily or Hawaii, every eruption changes the hazard posed by the next," she says.

Dr Solana explains that lava flows in a similar way to water in that it is dictated by gravity. As the topography changes, so must safety and evacuation plans. Part of her work is to study the speed and impact of lava flows to inform crucial decisions, such as evacuation times.

For Dr Solana, the science of volcanology has been a lifelong passion and she can say this as she was, quite literally, born in a volcano.

Her birthplace, Tenerife, the largest of Spain's

PHOTO: MARC SZEGLAT/UNSPLASH

Canary Islands, was formed three million years ago by the fusion of three islands due to volcanic activity.

Today she remains fascinated by the power of volcanoes – how they can bring down humanity's most advanced feats of engineering, a reminder of the built environment's fragility compared to the forces of nature.

"I'm fascinated by how all our technologies and infrastructures – the things we rely on such as the internet – can be affected by natural disasters; look at how air travel was disrupted by the Iceland ash cloud," she says.

THE MESSENGER

Dr Solana's complementary area of expertise involves converting data, such as hazard lava flow models and predictions, into usable information for emergency planners. Being able to communicate specific signs, forecasts and hazards helps people and authorities prepare, react and respond effectively.

"We want to prevent or reduce damage, so we look at effects and likelihoods. Where and who? How fast and when?"

"And because forecasts are numbers, likelihoods and probabilities, this can make it difficult to form clear, practical directions. For example, if I tell you there's a 10 per cent chance of an eruption affecting your village, would you judge this as a high or low percentage? How do you make a decision with that data?"

So Dr Solana's work is also about improving how authorities inform and communicate: "People don't like to know too much about hazards and risks unless – or until – they're directly affected. This can mean they go from wanting no information to suddenly wanting all the information – that's not ideal in an emergency situation. So it's vital to present information in ways that people find practical, acceptable, easy to follow [and] not too alarming."

In addition to modelling volcanic hazards and helping to forecast their impacts, Dr Solana also investigates and evaluates the perceptions, effects and impacts of hurricanes and landslides. She was part of the team assembled by Professor Richard Teeuw, a specialist in remote sensing (see page 20 for Professor Teeuw's story), and that also included Toby Meredith, a specialist in drones, to undertake a major investigation into hurricane Maria, which struck the Caribbean in 2017.

The team examined the physical and psychological complexities of the disaster – which areas fared better or worse, and why – including the consequences of decisions people made and subsequent lessons learned.



PHOTO: PIXABAY




PHOTO: ADRIENNE DOLPHIN

Tourists inside the White Island volcano that erupted on 9 December 2019.

"The unpredictable nature of natural disasters and people means one wrong decision can have huge consequences. There's a lot of responsibility and pressure on scientists when it comes to mitigation – especially if things go wrong," Dr Solana says.

However, she says that at the end of the day the research that scientists undertake, and the effectiveness with which this translates into good planning and effective action, is about saving lives and reducing fear.

When Dr Solana was a child, 25,000 people died in mudflows resulting from an eruption in Colombia. A little girl was stuck in mud for two days and slowly died.

"I was so shocked that with all our technology they couldn't save the little girl. This opened my eyes to the impact that volcanoes can have and was a big influence on my decision to make volcanology my life's work." 

I'm fascinated by how all our technologies and infrastructures – the things we rely on such as the internet – can be affected by natural disasters.

– Carmen Solana



Criminals open up to a VR show-and-tell

By following a burglar in action in real-time, researchers are shedding new light onto 'the criminal mind' with life lessons for all.

Arguably the most intriguing and gripping element of criminal investigations is crime scene reconstruction. Piecing together 'what happened' has held countless courtrooms spellbound since the dawn of the jury system (reputedly in medieval England) and is no doubt why this confluence of physical evidence and behavioural science is also so often at the core of fictional crime dramas. Human behaviour is endlessly fascinating.

Now there is a new medium into which the investigator can step – virtual reality (VR), which is opening up unprecedented opportunities for not just the forensic analysis of location, but also the mindset and real-time thinking of people in the act of committing a crime.

It is a tantalising new field of research developed by forensic psychologist Professor Claire Nee, Director of the University of Portsmouth's International Centre for Research in Forensic Psychology.

Professor Nee's expertise is burglary and she has pioneered the use of VR to get housebreakers to re-enact their crimes, so she can understand exactly how they act, think and feel as they go about committing their offence.

"Rather than their motivations for committing crimes, I'm more interested in how they enact the crime, the hours and days building up to it, and the aftermath," she says. "This hasn't really been looked at before."

Professor Nee says the information gathered by this research can be used to help catch offenders and also to educate householders and businesses about ways to better protect their properties and

possessions. Importantly, she says it can also help the offenders who want to desist from crime by unearthing the habitual decision-making that an experienced criminal uses and often is unaware of.

The Virtual Burglary Project, led by Professor Nee and the Max Planck Institute in Freiburg, is a significant step forward from previous research, which used interviews to explore burglars' thinking. The limitation of using interviews is that the information gathered is inevitably coloured by memory flaws and memory misattribution. No matter how willing a burglar is to talk, inaccuracies creep in.

"Sometimes what you think you did simply didn't happen. There's also the desire to not want to sound like a terrible person," says Professor Nee.

"When virtual reality arrived, I thought it would be great for re-enacting crimes. It's always better to watch behaviour, if you can, rather than interview people. VR discloses so much more information, because the person is actually re-doing the burglary."

VR also removes the mental effort and distraction involved in having to recreate the context of a crime committed in the past, she says.

VR REVELATIONS

VR technology produces richer, more detailed data and shows that offenders work fast, scoping their environment and rapidly picking up clues to make an instinctive decision about whether to proceed with a burglary.

"Our first virtual burglary study taught us a huge amount about how a person scopes the environment," Professor

Nee says. "We knew they avoid small children's bedrooms, but we thought that was because there's not much of monetary value in there. In fact, we discovered the real reason was it's 'wrong' to go into a baby or a child's bedroom – a moral code of sorts."

The re-enactments have also shown how offenders go straight to the high-value areas in homes – information that can be used to educate people on where not to put really valuable possessions.

"We're learning from the offenders," says Professor Nee. "Through them we can help people better appraise their environments, without making life inconvenient or increasing people's fear of crime. Instead, if we can help people make their environments less inviting to a burglar, and also help them

Sometimes what you think you did simply didn't happen. There's also the desire to not want to sound like a terrible person.

– Claire Nee



understand what burglaries and burglars are about, this will help them from becoming victimised.”

Having worked with very young offenders in a probation hostel, Professor Nee is especially interested in seeing the results of her research applied to more

progressive methods of rehabilitation. Instead of focusing on negatives and deficits and trying to fix them, this newer style of rehabilitation focuses on offenders’ strengths, works with them to imagine a better life and maps out ways to move towards that life. She believes it

ILLUSTRATION: 123RF



is a better way of working towards a goal that we all want: less crime.

Her interviews with burglars in prison look at these strengths. She identifies, for example, the expertise burglars display in rarely getting caught at the scene. They are, as she puts it, “dysfunctional experts”. Even though what they do is obviously criminal, many are ‘good’ at it.

RUNNING ON AUTO


Like their fellow citizens in more respectable occupations, she explains, burglars’ automatic scripts govern how they live their lives. When they commit offences, their cognitive scripts operate as mental maps to help them complete a task quickly with minimal risk. So they operate on automatic pilot with, as one burglar told her, “all my concentration go[ing] on listening out for someone coming back”.

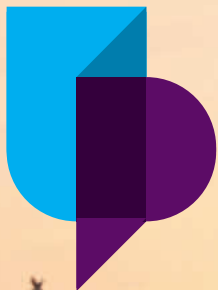
Moreover, as Professor Nee explains, even though many offenders genuinely want to give up crime, that ‘expertise’ is hardwired into them. They do not like going in and out of prison, but it becomes a way of life.

A crucial feature of this burglary mindset or burglary expertise that she has identified is “peer kudos” or the need to feel validated as part of a group.

This can be used in rehabilitation, Professor Nee says, with counsellors telling the would-be desisters, “Despite your challenges, you are ‘good’ at burglary. So let’s turn this ability into something positive and pro-social.”

She points out that many rehabilitation programmes have not taken on board the reality that offenders usually offend because of dysfunctional home lives, evidenced by the resultant automatic scripts that come from this and the people by whom they are surrounded. Being in prison with offenders or in a community with ex-offenders makes leaving that life even harder.

With the insights being gained through research that allows young criminals to reveal themselves in action, Professor Nee is looking for a new approach that better grounds rehabilitation in reality and sets up young offenders with a more positive, life-changing self-awareness. 



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The Scholar With the Skeleton Key

The pandemic has frayed nerves and exposed our tattered safety net. Can Jessica Calarco help people unlock the connection?

BY BECKIE SUPIANO





THE IDEA had been forming on the edges of Jessica Calarco's mind for some time. So when she got a set of questions late last fall about the pandemic's toll on families from the journalist Anne Helen Petersen, Calarco recognized her chance to pull it into focus.

After another long pandemic day of working and caring for her young children, Calarco felt it click.

"Other countries have social safety nets," Calarco responded to Petersen. "The U.S. has women."

It was just one line in a long interview. But Calarco, an associate professor of sociology at Indiana University at Bloomington, knew she'd crystallized something important. So did Petersen, who used it as the subject line for that issue of her newsletter, *Culture Study*. Momentum grew from there: Scholars quoted the line on Twitter. So did Hillary Clinton.

"The U.S. has women" combined Calarco's research on inequities in education and family life with her sociological position that many of the challenges Americans tend to regard as personal — finding appropriate child care, juggling work and care-giving responsibilities — are in fact systemic, and distilled it into something that could be a bumper sticker, or a rallying cry. Across the internet, women read those words and found something that's



Students won't remember everything a professor says. They'll remember the "headline." The public is the same way.

been in short supply during this pandemic year: a skeleton key for understanding what they were living through.

Like many academics, Calarco has long used her scholarly lens to make sense of the world around her. But now, the problems she studies have grown more urgent — and relevant for more people. The Petersen interview merely accelerated a trend already underway: Journalists are increasingly turning to Calarco to help explain how the pandemic has set women back.

"The U.S. has women" is the kind of simplification many experts try to avoid. On Twitter, some readers took issue with her statement. Other nations lean heavily on the unpaid labor of women to keep families, schools, and communities running, too. Not every other developed country has a strong social-safety net. Calarco knows all of that, and agrees that nuances matter.

Coming up with a grabby distillation is a technique, one Calarco often uses in her teaching. She'll make a point in general terms, then unpack it, and add further context. Students, she knows, won't re-

Photographs by Clay Lomneth for the Chronicle

Jessica Calarco chases her daughter.



Calarco answers emails as her son and daughter play in the background.

member everything she said. They'll remember the "headline." The public — especially now, with everyone's emotions running high and focus fractured — is the same way.

Giving families the support they really need would require a sea change, Calarco acknowledges, in both policy and culture. The first step is getting people's attention.

CALARCO'S PARENTS married young; she was born when her mother was still in college, midway through a fall semester. So for a time her mother toted her along to some classes. It was too much, though, and her mom took a long hiatus from her education before eventually becoming a teacher. College wasn't designed for mothers.

Calarco's own path was much straighter. She earned her bachelor's degree at Brown University and, six years later, received a Ph.D. from the University of Pennsylvania. She had her children after that. But she thinks about her mom's experience a lot.

When the pandemic hit, Calarco was studying how mothers make controversial parenting decisions — about breastfeeding, for example, or leaving the work force, or screen time. Her sample was 250 Indiana women who were pregnant in 2018. Calarco expected her research to reveal how women's preferences are swayed by their social networks, and what happens when they can't make the choice they want to. The pandemic, of course, has changed the calculation on a host of parenting decisions, and introduced new ones. Calarco and her research team are now asking 139 of the original participants and their partners pandemic-specific questions.

Some of the mothers are students, too. One with an 18-month-old child was on the cusp of completing a degree that would have made possible a career in health care, earning more money than her husband made working at a warehouse. She had only a couple of classes left, but Covid-19 meant she was now also providing full-time care for her toddler. That, Calarco says, left this mother "too tired to get homework done," and "just exhausted all the time."

Most students at Bloomington are recent high-school graduates. But Calarco doesn't assume that college is all her students have going on.

So when she was figuring out how to move her courses online last spring, she made compassion a priority. One of her first decisions: telling the 250 students in her intro course that none of them would receive a lower grade than they'd had before going remote. Calarco was also part of a university committee on equitable assessment in the pandemic. On that panel, she argued that giving a traditional exam — closed book, taken at a set time — would increase disparities among students.

That argument put Calarco at odds with some of her colleagues, who were worried about maintaining academic standards — and preventing cheating. But Calarco's view was that to continue as if nothing had changed would be unethical.

Calarco thinks in terms of systems: whom they harm and who has an advantage as long as those systems remain in place. For her dissertation, Calarco observed third graders, then followed them through several years of school. Her work revealed that middle-class children tend to request and receive extra support from

their teachers, giving them an edge over their lower-income classmates.

That study became Calarco's first book, *Negotiating Opportunities: How the Middle Class Secures Advantages in School* (Oxford University Press, 2018), which won the Pierre Bourdieu Award for Best Book from the Sociology of Education Section of the American Sociological Association. It also deterred her from doing further scholarship on elementary and secondary education, at least for now. The ways that school systems deepen class stratification are so well established, Calarco says, that documenting them feels like "screaming into the void." The problem isn't that people don't know about education inequity. The problem is that a system that entrenches existing advantages suits some families just fine.

On a snowy afternoon in February, Calarco conducted an interview over Zoom with a mother whose children were 2 and 6. For an hour, Calarco asked about pandemic precautions, remote schooling, and family relationships.

Last spring's sudden shift online halted a lot of academic research. For Calarco, it presented challenges, but also a big opportunity.

She decided to try to capture the pandemic's toll on the mothers she'd been following. She brought on a new co-author, who contributed more health-oriented questions and some additional funding. She also secured new approval from her institutional review board and rushed to get an additional survey and round of interviews into the field in April. Even though she already had approval to conduct interviews by phone or video call, it was a mad scramble.

The result: Calarco's Pandemic Parenting Study has produced more data, on more topics, than she can possibly analyze. She's working with one former and seven current graduate students who are using the data as a source for different projects.

Moving her research interviews to Zoom was easier than, say, shifting her large introductory course, Calarco says. She and her graduate students had often interviewed mothers in their homes, so peering into them through a video camera wasn't such an adjustment. Still, participants' home lives are not what they used to be.

On that afternoon in February, the subject's whole family was home. The parents had opted for remote learning for the 6-year-old. The 2-year-old's school was closed. The mother works part time as

un·con·ven·tion·al

/ˌənˌkənˈven(t)SH(ə)n(ə)l/

adjective: not based on or conforming to what is generally done or believed.



Unprecedented challenges require unconventional wisdom.

In preparation of welcoming students safely back to campus in the fall 2020 semester, Rice University invested in a social distancing strategy, which included massive circus tents that served as temporary classrooms and public art installations. The temporary structures accommodate up to 50 students and an instructor while maintaining social distance guidelines.



a data specialist, and is pursuing a certification; her husband works full time as a marketing director, holed up in their bedroom.

So while the family's younger child napped through most of the interview, the older one made a few appearances on Zoom. After her mother told Calarco about a day when she'd had a terrible migraine, the girl popped into view, making a silly face. When the mother was describing the challenge of keeping the family running with no outside support, the kindergartener re-emerged to show off a set of drawings she'd done for school.

Then the 2-year-old woke up. "I'm just going to step away for one second," the mother told Calarco. She got out of her chair, revealing a view, out the window behind her, of a snow-covered backyard swing set.

"No problem," Calarco replied. She waited.

After a brief lull, the 6-year-old came back into view, alone. "My mom's just helping my brother," she told Calarco.

"Thank you so much for letting me know," Calarco replied. While her own 6-year-old is attending in-person school, that day was a snow day, so she was watching TV in another room.

Near the end of the interview, Calarco asked about the family's school and child-care plans for the fall. The mom said it wasn't yet clear what options they'd even have — and mentioned how strange it would be to be away from her children after so much time together.

But the mother didn't feel great about that time. "Right now," she said, "there's just no way to balance the ugly with the fun part of being the mom — who is also the teacher, who is also the task manager, and the rule enforcer, and the eat-your-vegetable yeller."

American culture already conditions mothers to view those frustrations as personal problems. Hunkering down at home with far too much to do during the pandemic has made it hard for them to even compare notes. But a clear pattern has emerged, and it's starting to get public attention.

One notable example: *The New York Times's* recent project titled "The Primal Scream," which documents American mothers in crisis through narratives, data, advice — and, yes, audio of mothers' actual screams.

Stories, on their own, don't solve the world's problems. But they make people feel seen. And they make it harder to pretend societal problems stem from individual choices.

THIS is Calarco's pandemic story: She remembers the last mom she interviewed in person, how she checked that it was still OK to visit her house, how they mostly sat outside. She anticipated that life would move online: Her husband, Daniel, then the chief of staff for the university's vice president for information technology, spent early March in contingency-planning meetings. Calarco started recording her lectures, and gave students the option of watching online about two weeks before the university decided for them.

Those first six weeks were the worst. Calarco recognizes all the advantages she has: a partner, a good job with tenure, the ability to work from home. Even from that position of strength, it has been an overwhelming time. Calarco started teaching hundreds of students online while remaking her research plans. Her husband, now in her words "the incident commander for the pandemic for IT," spent his days in endless meetings for setting up Wi-Fi in parking lots, getting personal routers to students, and just figuring out how the university could function fully online. He worked from the home office; she



set up in the kitchen, as far away as she could get on that level of the house. But there were no doors, so Calarco could still hear everything.

Then there were the kids. Their daughter was in kindergarten when her school went remote last spring. In the beginning, she was given something like 25 pages of worksheets a day. Worksheets that almost immediately killed the family's decade-old printer. Worksheets that she couldn't read herself, because she was still learning how. Her little brother, then 2, was also home, his child-care center closed.

The kids, Calarco recalls, were confused and angry about how much their parents, right there at home with them, had to work. "My kids watched a lot of TV," Calarco says. "That's how we got through it."

It's a last resort plenty of parents are familiar with, and one that Calarco has been open about, including on Twitter, where she has some 26,000 followers. There are countless ways to present oneself on social media. Calarco's Twitter account is clearly professional, and she frequently comments on issues related to her expertise. But while she's careful about her kids' privacy, it's very clear she has them. Calarco tweets about those kindergarten worksheets, her daughter's drawings, snippets of amusing things her kids say to her.

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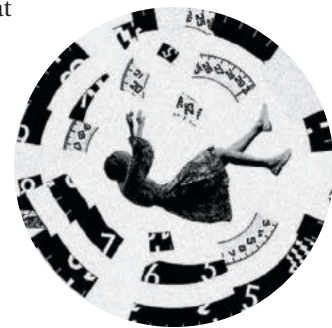
Early in the pandemic, Calarco recalls, her children were confused and angry about how much their parents, right there at home with them, had to work.

The first paper Calarco submitted from her Pandemic Parenting Study was rejected. The reviewers weren't sure the Indiana moms were representative. And they said the paper was too journalistic.

So Calarco fielded a nationally representative, in-depth survey of 2,000 parents across the United States. But she's wrestling with the other critique. Calarco's research, colleagues say, is rock-solid. She's meticulous. Her publication record is stellar. But she wants to share what she's heard in her interviews with a broader audience.

"I just want to tell these stories," she says. "I don't care — I mean, I have tenure — I don't really care what academia thinks. I think this is an important story to tell." The public, Calarco says, needs to understand the disproportionate impact the pandemic has had on women — and the deep societal inequalities that reveals.

She's working with an agent, and hopes to land a book drawn from the Pandemic Parenting



As consistent as patterns of gender imbalance have been, “in the pandemic, it’s really taken on new forms.”

Not long ago, she shared images of unfolded heaps of clean laundry and groceries on shelves still in their bags.

That willingness to pull back the curtain extends beyond Twitter. It's the theme of Calarco's most recent book, *A Field Guide to Grad School: Uncovering the Hidden Curriculum* (Princeton University Press, 2020), meant to buoy graduate students from less-advantaged backgrounds and the faculty members — often women and people of color — who advocate for them.

In both cases, Calarco is using her platform to help foster “an honest dialogue about what life is really like in academia,” says Elaine Hernandez, an assistant professor of sociology at Indiana who is a collaborator and a friend. The posts about working while caring for young kids, she adds, resonate much more broadly than that.

Calarco decided not to pursue another project on education because the problems felt well established but impossibly stubborn. Now she feels the same frustration about gender.

Gender inequality is so persistent that new findings feel familiar, says Annette Lareau, a professor of sociology at Penn who was Calarco's dissertation adviser. That pattern just played out for another former graduate student, whose groundbreaking work on how unemployment among professionals differently affects men's and women's home responsibilities was greeted initially as something everyone already knew. *Of course* the unemployed men spent their days searching for jobs. *Of course* the unemployed women spent theirs doing child care and chores — even if they had been the primary breadwinner.

As consistent as patterns of gender imbalance have been, Lareau says, “in the pandemic, it's really taken on new forms.”

Some 2.3 million American women have left the labor force since the pandemic began, according to a recent analysis of Bureau of Labor Statistics data conducted by the National Women's Law Center. Women's labor-force participation rate stands at 57 percent — the lowest level since 1988.

Study with a trade publisher. Calarco wants to write it for women like the ones in her study. Women who are blaming themselves as they struggle to carry this burden; who haven't caught their breath, much less had time to consider the broader picture. She wants to reach their mothers-in-law, the ones who urge them to enjoy this extra time with their kids. She wants to reach younger women, who might not yet realize that, one way or another, this is on track to be their problem, too.

Will any men read such a book? “Probably not,” Calarco says. “I mean, if they do, that's great.”

The pandemic, Calarco's interviews suggest, has made fathers more aware of the stress of parenting. But that hasn't led them to take on more of the work.

Despite the viral quote she gave Anne Helen Petersen, she acknowledges that this country does have some social-safety nets. But those safety nets are mostly private — they're tied to employment in professional jobs, or family money, or social connections. Right now, even those are frayed. Will privileged women join a movement to demand a public safety net? Or just repair the boutique ones they had before?

The pandemic has shaken so many things loose that we'll have real choices to make about how to put them back together. But just because progress is possible doesn't mean we'll choose it.

If Calarco holds out some hope, it's because of this: In the early days of her study, the mothers she interviewed expressed grief and guilt. But as the pandemic ground on, something shifted. She started hearing more anger.

Just maybe, that marked the beginning of what Calarco believes it will take for things to really change: collective rage. ■

Beckie Supiano writes about teaching, learning, and the human interactions that shape them. Follow her on Twitter @becksup.



AUDREY MALO FOR THE CHRONICLE

The New Enrollment Playbook

What changes from this year will stick?

BY JEFFREY J. SELINGO

WHEN COVID-19 SHUTTERED CAMPUSES LAST SPRING, colleges were nearing the end of their annual admissions cycle. Enrollment leaders thought the move online was temporary, merely inconveniencing their April on-campus open-house attempts to reel in their next class. Like most everyone else, admissions deans were thinking in terms of weeks, or at most months. Will things be back to normal in May? Maybe June?

Then as summer arrived, and the College Board and ACT struggled to offer enough testing sites, something happened that ensured this year would be different: Some 600 colleges, including nearly every selective institution, announced they wouldn't require test scores for the high-school Class of 2021. By the fall, as high schools across America opened virtually, admissions officers accustomed to being on the road recruiting students started to map out a new enrollment playbook.

Admissions is often described as a mix of art and science, and in recent years the rise of "big data" has tipped the balance toward science. The rule in admissions is that if you alter how you recruit or admit or enroll students — whatever you do — do so gradually. That way you know — or at least can guess — which lever you pulled had caused which shift in your enrollment model. But the pandemic reshaped almost every dimension of admissions — and did so all at once. Admissions officials have been left trying to untangle cause and effect.

Among all aspects of higher education, admissions is perhaps the most tradition-bound due to its recruiting calendars and campus tours, common application deadlines, and rigid rating scales for assessing applicants. But a year since the coronavirus took hold in the United States, the debate among enrollment leaders is no longer when the traditional customs of admissions will return, but what changes from this year will stick, and whether colleges should speed those changes along.

"We all have disparate pieces of information right now. We're all measuring different things. It's hard to make sense of it all," says Charles Deacon, dean of admissions at Georgetown University since 1972. "Some traditions and routines will survive, but they all won't."

THE REVIEW

Admissions is a game with complex rules. Selective, elite colleges typically set the rules of engagement because they're rich and inundated with applicants; colleges with fewer resources that educate the vast majority of undergraduates follow along where they can. But the pandemic is widening that gap as regional public colleges and less-selective institutions struggle to attract applicants, leading to a vicious circle of falling revenue, tightening financial-aid budgets, and cuts in programs and the faculty.

Even before the virus hit, the cornerstones of admissions — early decision, testing, deposit deadlines, wait lists — were constantly shifting based on a college's priorities. That's still the case, but now the virus has a big say, too, and will continue to have a say well beyond this year. The pandemic is no longer a crisis to be managed for the short term, but rather an opportunity to reform the way colleges handle admissions in the long run.

NOWHERE is the virus's impact more apparent than in how it is shaping the future of testing. Already, dozens of colleges have announced an extension of test-optional policies for a second admissions cycle, including the entire Ivy League, Stanford University, and the University of Texas at Austin. It's clear the SAT and ACT will not return to their pre-pandemic prominence. Even the ACT's chief executive admitted as much in a recent blog post. Some colleges will remain test-optional when the pandemic is over, but how far up the pecking order will that change stick? And will applicants trust colleges enough to judge them without test scores to stop taking the exams entirely?

Let's pause for a moment to remember what things were like before

the pandemic. Test-optional policies were ubiquitous among less-selective institutions and a small set of selective liberal-arts colleges, but they were almost unheard of among big public universities and elite private institutions. The outlier was the University of Chicago, which went test-optional in 2018. Still, most applicants to Chicago submitted scores — around 85 to 90 percent before the pandemic — and the university admitted about the same proportion of students with scores.

Statistics like that signaled to applicants that test scores still mattered, especially at ultra-selective colleges. Think about this: Even as the number of test-optional colleges grew in recent years, so too did the number of students taking the SAT or ACT. So last year, when hundreds of colleges went test-optional — some reluctantly — a lot of high-school seniors and their counselors didn't take them seriously. In a series of Zoom sessions I held with counselors and parents last fall, the most frequently asked question by far was whether testing was really optional. Even the National Association for

College Admission Counseling put out a statement telling families to trust the test-optional policies.

The skepticism started to dissipate in December, when a handful of colleges released their early-decision results. Tufts University announced that more than half of its early-applicant pool had applied test-optional, and 56 percent of those accepted had applied without test scores. Nearly one-third of the University of Notre Dame's early admits had applied without scores. At Boston University, 71 percent of early admits were accepted without scores.

The vast majority of college applicants apply for regular decision, with deadlines around the beginning of January. The numbers from this year's early-decision rounds were reaching high-school seniors just as many of them were applying for regular decision. For a certain set of prospective applicants — namely, upper-middle-class and wealthy students — the early numbers seemed to indicate that applying test-optional might be the way into a selective college. Unable to take campus tours in person or meet with college representatives visiting their high schools, seniors were already hedging their bets and applying to more colleges than usual this year. *If Harvard or Stanford or NYU doesn't want a test score, why not send in an application to one of those places?*

"It was ridiculous," Diane Campbell, director of college counseling at Liberty Common High School, in Colorado, told me. "My students were applying to 15 to 20 schools, on average. Usually, they apply to five to 10."

Students nationwide applied to more colleges than usual this year. Application volume rose by 10 percent, according to the Common Application, although the number of unique applicants didn't increase as much, and first-generation and low-income applicants declined. Most of the increase in applications went to selective private colleges and big public universities, while smaller and less-selective universities were left to beg for students. In other words, the rich got richer. The University of California at Los Angeles received more than 160,000 applications, a jump of 25 percent over last year. Colgate University saw its applications more than double. Pennsylvania State University was up 11 percent; Harvard, 42 percent.

As we come to the end of this admissions cycle, a critical question is emerging: Just how much information will the new class of test-optional colleges share about the applicants they accepted? Releasing too many details is a double-edged sword: If a college accepted a high proportion of students without test scores, it could encourage another surge in applications next year and tax the admissions staff once again; but if the college accepted too few, it risks the wrath of critics who will question its commitment to equity (test scores are highly correlated with family wealth).

The other question facing colleges is more fundamental: Should they go back to the tests at all?

At Emory University, where applications rose 19 percent and nearly half of them arrived without test scores, "it wasn't just an additional set of applicants; it was a different group of applicants," said John Latting, the university's dean of admission. More applicants were from Georgia, and more were from underrepresented groups. "I think testing is a specter out there for certain students," he said. "It's a deterrent. It's much more powerful than I ever realized."

Left unsaid, of course, is that it wasn't a test score that had kept those students from applying. Rather, it was how Emory and hundreds of other colleges considered those test scores that had kept them from applying. Colleges every year publish their average scores. Anyone who glances at the *U.S. News & World Report* rankings sees a column with a list of the middle 50 percent of test scores for each college. For would-be applicants, those figures are like a flashing red sign: Don't bother applying if you're below this range.

ONE VIEW IN ADMISSIONS is that the SAT and the ACT offer a critical balance for assessing students who come from high schools of widely varying quality. But that perspective isn't universally shared. Numerous studies show that grades by themselves are a better predictor of a student's success in college than are test scores on their own. Yet studies also show that both metrics, taken together, are the best predictor of success — better than either measure alone. Test-optional colleges are now trying to answer this question for themselves: Are test scores just noise in an application already crowded with grades, activities, and recommendations, or do they really send a useful signal?



FROM THE CHRONICLE STORE

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That calculation will help determine whether institutions extend their test-optional policies indefinitely. Another factor will be how much they want to curb the growth in applications or navigate the politics of standardized tests among faculty members, alumni, and politicians. Faculty members control the admissions policies at many colleges, and despite being criticized as left-leaning, they tend to view test scores as the standard-bearer in a sea of academic measures they believe are inflated; alumni feel similarly, and state politicians often push for admissions testing as a metric by which to measure elementary and secondary schools.

Without test scores to consider, most admissions offices are leaning into two other measures: the rigor of the classes that applicants took in high school and their grades in them. For those applicants who submitted test scores to the Georgia Institute of Technology this year, most had high scores to begin with, said Richard Clark, Georgia Tech's director of undergraduate admission, rendering courses and grades more useful anyway in the review process. Case in point: 93 percent of test-optional applicants to Georgia Tech took calculus in high school, which isn't covered by the SAT's math section per se.

History shows college applicants tend to travel in clumps from high schools: Campuses receive applications from several thousand high schools, not tens of thousands. As a result, when a college enrolls a significant number of graduates from a particular high school — say, 10 students over the course of several years — it can track the grade-point averages and eventual degree completions of those students from that school.

At the University of Washington, application readers use a

GPA-comparison tool for nearly every high school in the state, as well as many outside the state. The tool compares the average GPA of prior students who enrolled from a specific high school with their GPA after freshman year at the university. The data indicate to those reviewing applications how grades at one high school would translate into grades at the university. "Maybe a student has a lot of B's in some rigorous courses, but the data can show B's at that school are quite

Despite a reshaping of admissions forced by the pandemic, colleges seem unwilling to rethink their admissions policies or process.

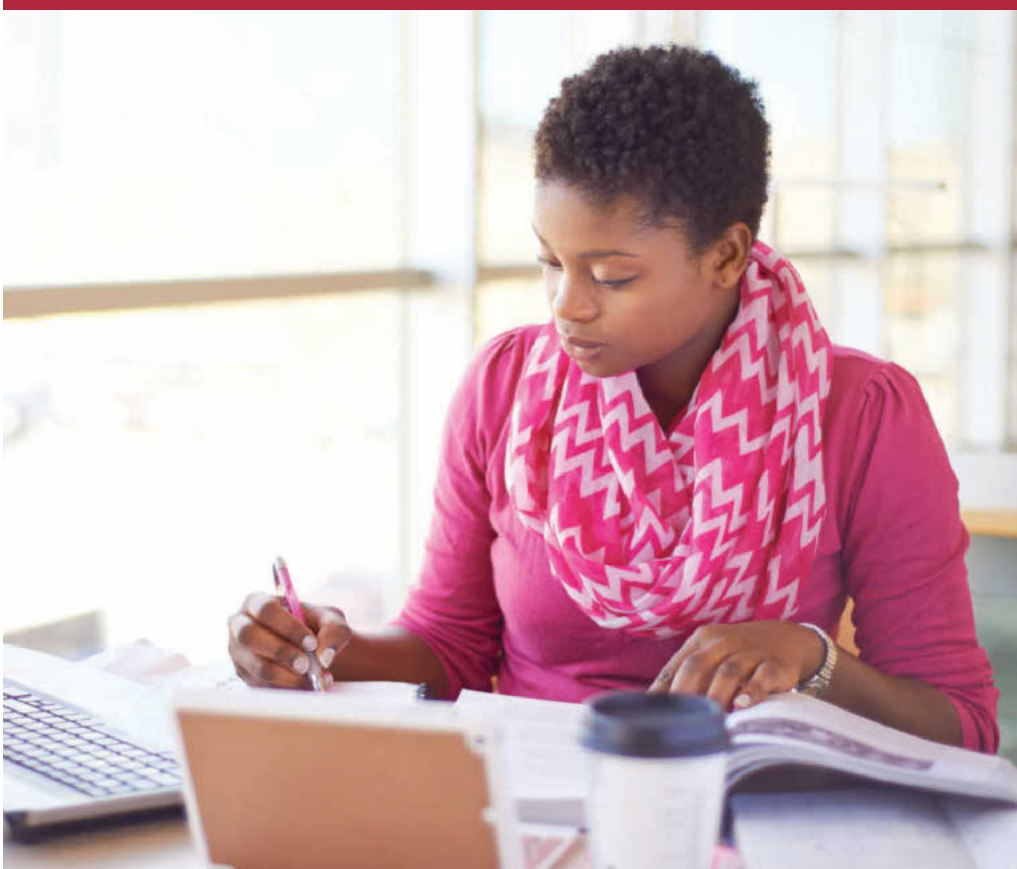
impressive," said Paul Seegert, the university's director of admissions.

The problem is that if colleges rely too much on such data, they risk exacerbating existing inequities by taking more students from high schools that have long supplied a significant portion of their incoming class at the expense of students from underperforming schools.

But Andy Borst, director of undergraduate admissions at the Uni-



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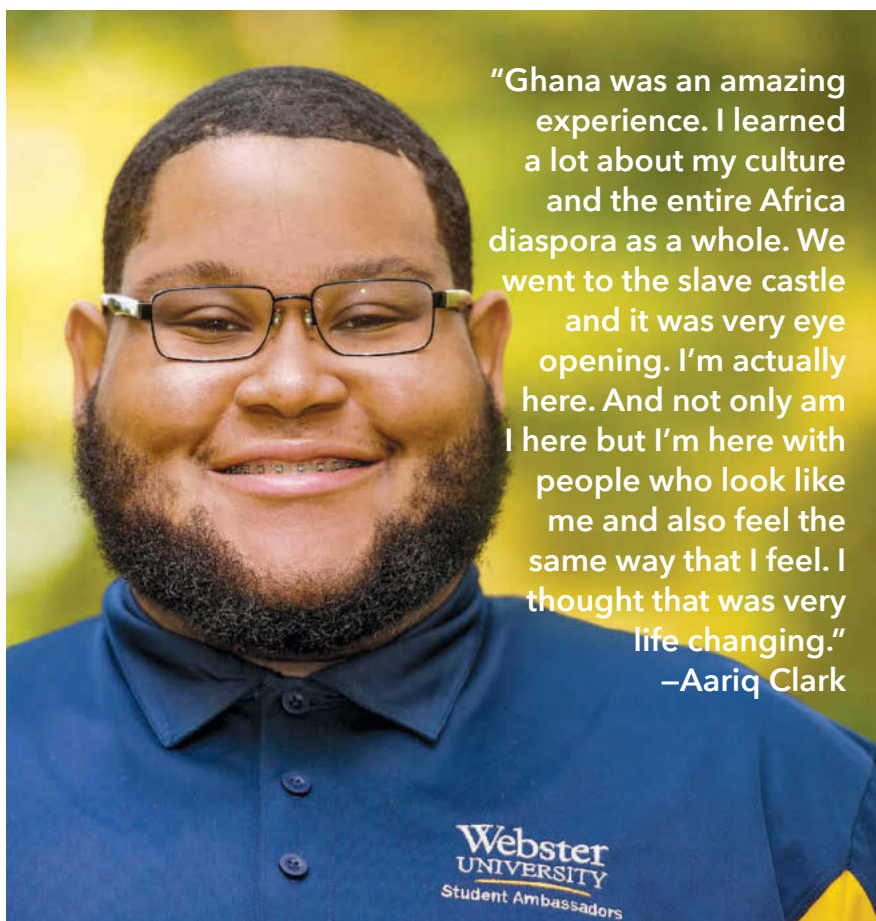
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—Aariq Clark

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versity of Illinois at Urbana-Champaign, told me colleges could use such data to swing in the other direction, too. "There are students in our admit pool this year who historically wouldn't have been admitted because faculty expressed concerns about whether they could succeed because of test scores," he said. "But we didn't know that they couldn't succeed because they were never accepted. This year, we can make assumptions based on average SAT scores for the high school, but we can also use that data to admit them and funnel those students into our support programs."

Even as enrollment leaders grapple with how to wrap up recruiting this fall's freshman class, they're also looking ahead, wondering if the tweaks they made in the evaluation process this cycle will work in the next one as well. While the pandemic disrupted the admissions calendar for the high-school Class of 2021, those students were more than halfway through high school when the pandemic hit. Application readers made assumptions that what students were doing up until March 2020 would continue through their senior year.

Members of the Class of 2022 were only sophomores, however, when the pandemic disrupted their education. They were just finding their footing in high school. Admissions officers already report reading vague recommendations for students in the Class of 2021 from teachers and counselors who knew them primarily through a screen. And those reviewing transcripts have noticed some of this year's seniors retreated from rigorous classes if they were mostly in school online. Both trends are likely only to increase among next year's seniors.

And it won't end there. Many parts of applicants' admissions files are baked long before they begin the college search — from the courses they take (or don't take) in eighth grade, to the activities they start in elementary school, to the teachers they get to know as freshmen. As long as this generation of students makes choices about what they do or don't do in school based on their experience this past year, the effects of the pandemic will live on in college applications for years to come.

IN THE END, college admissions is a business. The selection process is not about the applicant; it's about the college. It's not about whether an applicant is "worthy," but whether he or she fits into a college's agenda, whatever that might be. Every college has different needs that could change by the year. The uncertainty of the pandemic — the lack of test scores, the surge in applicants, questions about who will show up if accepted — is giving institutions "license to lean into their priorities even more this year," said Clark, the admissions director at Georgia Tech.

I spoke to dozens of admissions deans and their staffs over the last 12 months. And while each talked about different priorities — more full-payers, more majors to fill a new program that is a favorite of the president, more men, more students from a certain ZIP code — it was notable how often their stories followed the same narrative: an unwillingness to rethink the qualities they consider in applicants or to reform the admissions process entirely.

If they wanted to, elite colleges could use this moment and their wealth to expand their freshman classes to take more of the highly qualified applicants they now reject rather than advertise yet another year of record-low acceptance rates this spring. Rather than confuse potential applicants with ambiguous test-optional policies, they could disclose who gets in and why without test scores, or stop considering scores altogether. Colleges could use the expertise they gained with virtual events during the pandemic to connect with feeder high schools, while using their limited fall-travel budgets to reach, in person, prospective students who lack access to college counseling. And colleges could eliminate some of the enrollment-management tactics that needlessly raise the anxiety of applicants every year: binding early decision, demonstrated interest, multiple financial-aid forms, and ballooning wait lists that promise to grow even bigger as this hectic year shakes out.

However, all of those things will require trade-offs that colleges

have been unwilling to make to this point: expanding their narrow set of admissions metrics, living with higher acceptance rates or lower test scores, maybe dropping a few places in the rankings. Indeed, it seems the only time colleges and universities are willing to change is when they are pressured to do so or rewarded for their actions. Take, for example, the push to enroll more low-income students at elite universities. It became an institutional priority on many campuses only after years of negative media attention and when *U.S. News* started to measure social mobility in its college rankings.

In the modern history of higher education, there have been several significant periods of change in enrollment strategies. Those changes typically came at moments of great social or technological transformation: affirmative action during the civil-rights movement, in the 1960s; the growth of direct marketing when the last of the baby boomers left campus, in the 1970s; the rise of the Common Application, in the 1990s, after the birth of the World Wide Web.

Caroline Hoxby, a professor of economics at Stanford, described the result of those shifts in a 2009 paper as a “re-sorting” of students in which their choices were driven less by distance and “far more by a college’s resources and student body.” The proliferation of direct mail combined with the ease of interstate travel and the expansion of discount airlines in the 1980s allowed high-school seniors in Massachusetts to more easily picture themselves on a campus in California. Admissions — and higher education as a whole — moved from a largely regional business to one that was nationalized, and eventually internationalized.

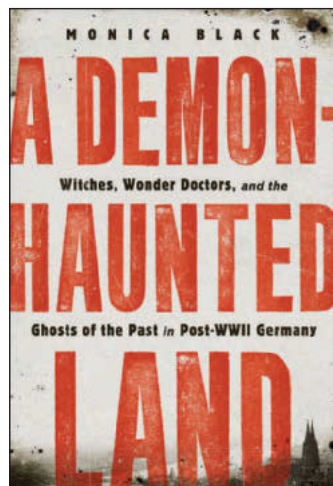
Now another reshaping of the admissions landscape may be underway. Student mobility could slow in the coming year as teenag-

ers enroll in colleges closer to home. Sure, we’re right to be skeptical of the surveys, and it might be a one-year blip, if one at all. But if students have a good experience at some nearby campus, expect word to get back to their high schools, potentially creating new migration patterns in the years ahead.

Families may also put slightly less weight on prestige and more on affordability in an economy ravaged by the pandemic. They might rethink the value of the in-person experience after a year of Zoom U. And they might place additional emphasis on the return on their investment in a college degree in a competitive job market after Covid. This public-health crisis also comes at a time of racial reckoning and just as the number of high-school graduates is expected to fall, and the racial, ethnic, and economic composition of students in the college pipeline is quickly shifting.

In my interviews with admissions officers, I was often reminded that for all the focus on standardized testing now, the tests themselves are a symptom, not a cause, of deep inequities. Yes, test scores don’t create inequities — they reflect them. But universities get to choose what to do with those scores. Institutions are the central actor in a moment ripe for another re-sorting in admissions, when colleges can choose to step away from the herd and write their own rules for a new recruitment game. ■

Jeffrey J. Selingo, a former editor of The Chronicle, is the author of Who Gets In and Why: A Year Inside College Admissions (Scribner, 2020). He is a special adviser at Arizona State University and founder of the ASU/Georgetown University Academy for Innovative Higher Education Leadership.



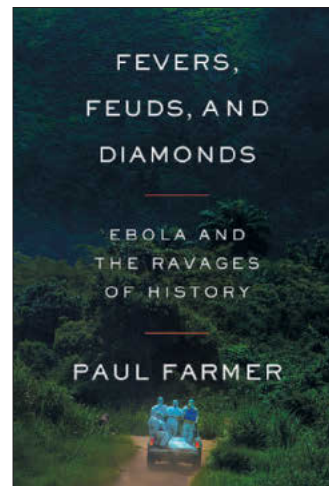
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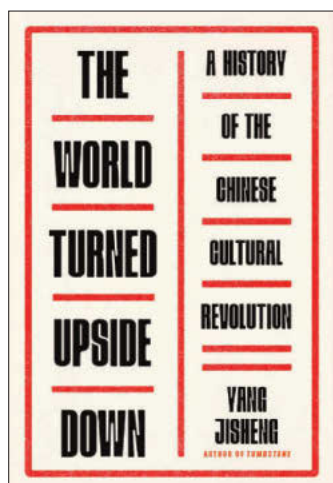
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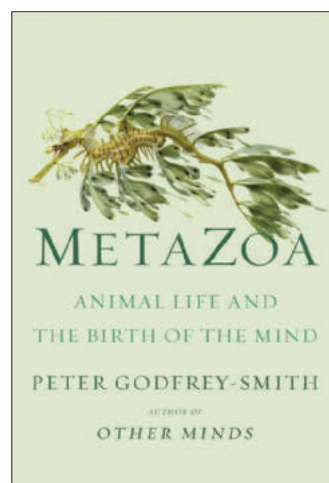
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What Higher Ed Has Endured

Tallying up the year's brutal toll.

BY AUDREY WILLIAMS JUNE

\$120 billion

Estimated new expenses incurred and revenue lost by higher education during the pandemic, according to lobbyists seeking aid from the federal government.

Source: Letter to Congress from the American Council on Education, December 2020

\$37 billion

Money provided to higher education in the first and second rounds of coronavirus stimulus relief.

Source: Text of legislation

\$24 billion

Estimated new expenses, including Covid-19 testing, classroom modifications, and technology for virtual instruction, incurred by 107 colleges that are among those top-ranked by *U.S. News & World Report*.

Source: Paul N. Friga/HelioCampus, data collected from news released from March to December 2020

\$225 million

What the NCAA distributed to its Division I member institutions last June. The figure was about \$375 million less than it had budgeted, mainly because the NCAA's biggest revenue producer — the men's basketball tournaments held during "March Madness" — was canceled because of the coronavirus.

Source: NCAA

22%

College fund raisers who expected to meet their goals for the 2020 fiscal year, a prediction made just after the pandemic began.

Source: Washburn & McGoldrick, April 2020 and January 2021

65%

Fund raisers who expected to meet their goals for the 2021 fiscal year when asked nine months later.

Source: Washburn & McGoldrick, April 2020 and January 2021

More than 85

The number of higher-ed administrators, professors, students, and staff members who have died of Covid-19 through March 1, according to news coverage and institutions' statements. Faculty members accounted for the largest number of those deaths, with 39.

650,000

Estimated number of jobs shed by colleges and universities from the pandemic's start to the end of 2020 — more than 13 percent of the higher-education work force.

Source: Bureau of Labor Statistics, February 2021

55%

Faculty members who have seriously considered changing careers or retiring early since the pandemic began.

Source: The Chronicle of Higher Education/Fidelity Investments survey, conducted in October 2020

90 minutes

Time for research that has been lost each day of the pandemic by female faculty members with children.

Source: Working paper from the National Bureau of Economic Research by Tatyana Deryugina, Olga Shurchkov, and Jenna E. Stearns, January 2021



22%

The decrease in high-school graduates going straight to college in the fall of 2020, compared with those who did so in 2019, driven mostly by a drop in low-income and urban high-school students.

Source: National Student Clearinghouse Research Center, December 2020

About 560,000

The drop in the number of undergraduates enrolled in the fall of 2020, a 3.6-percent decrease from a year earlier.

Source: National Student Clearinghouse Research Center, December 2020

About 40,000

International students who chose to defer their fall-2020 enrollment to a future term.

Source: Institute of International Education

56%

The increase in coronavirus cases over a six-week period during the fall-2020 term at colleges of 20,000 students or more that opened for in-person instruction.

Source: Centers for Disease Control and Prevention, January 2021

594%

The increase, since 2018-19, in the number of colleges that made standardized tests optional for admission in the fall of 2020.

Source: National Center for Fair & Open Testing

76%

College students who said their mental health had worsened since the pandemic began.

Source: Active Minds, September 2020

40%

Students who lost a job, an internship, or an offer of either one due to Covid-19.

Source: Paper in the Journal of Public Economics by Esteban M. Aucejo, Jacob French, Maria Paola Ugalde Araya, and Basit Zafar, November 2020

Innovation heats up: the self-cleaning mask

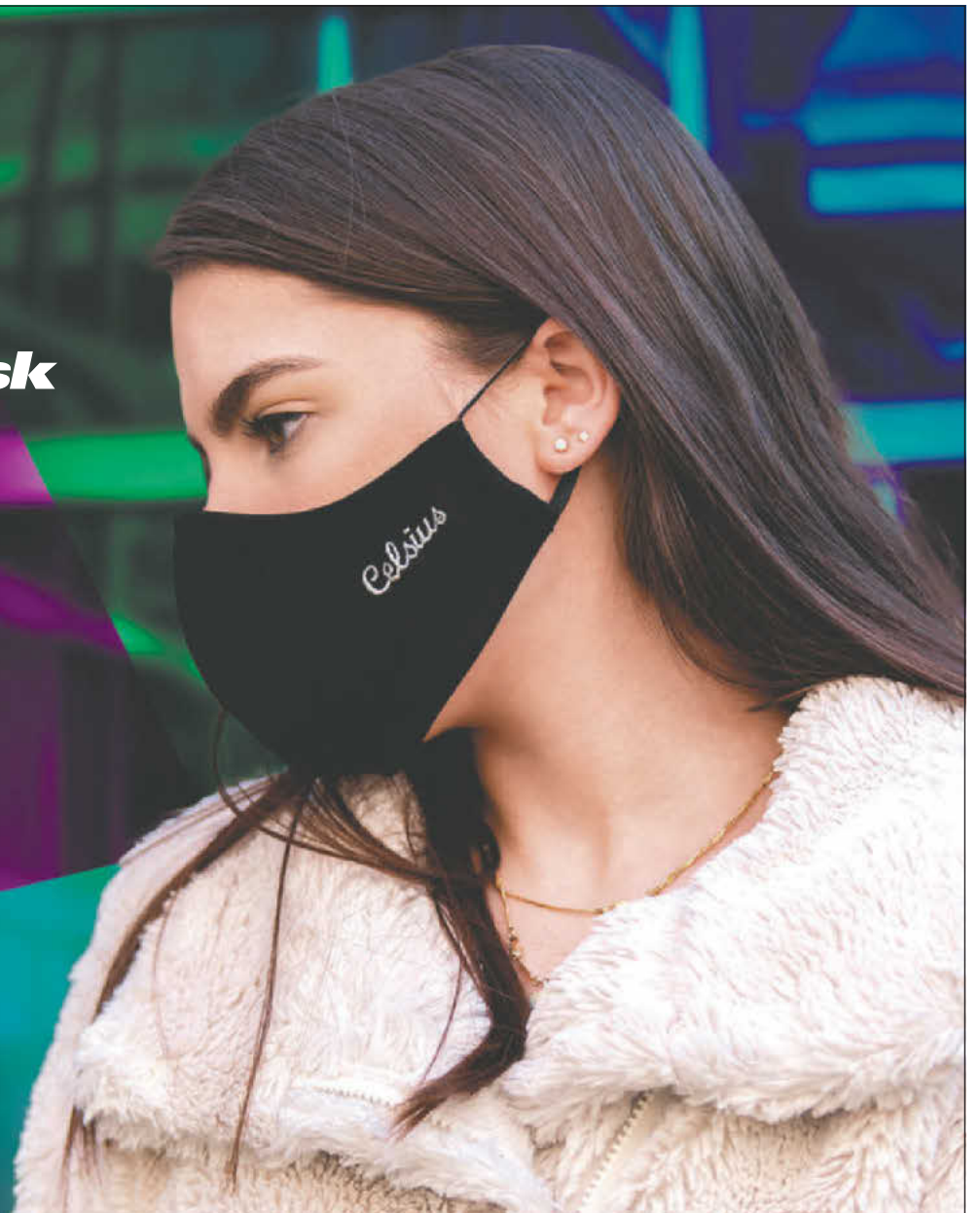
VCU engineering student and CEO of Tekstyle McKenzie Piper has partnered with the university to realize her idea for a self-cleaning antiviral mask. "Studies that have shown us that heating coronavirus up to 80 degrees Celsius ... will neutralize the virus," she says. The final design reflects heat, keeping the wearer cool and comfortable. From research to launch, Piper credits her VCU support system for bringing this important innovation to market so quickly.

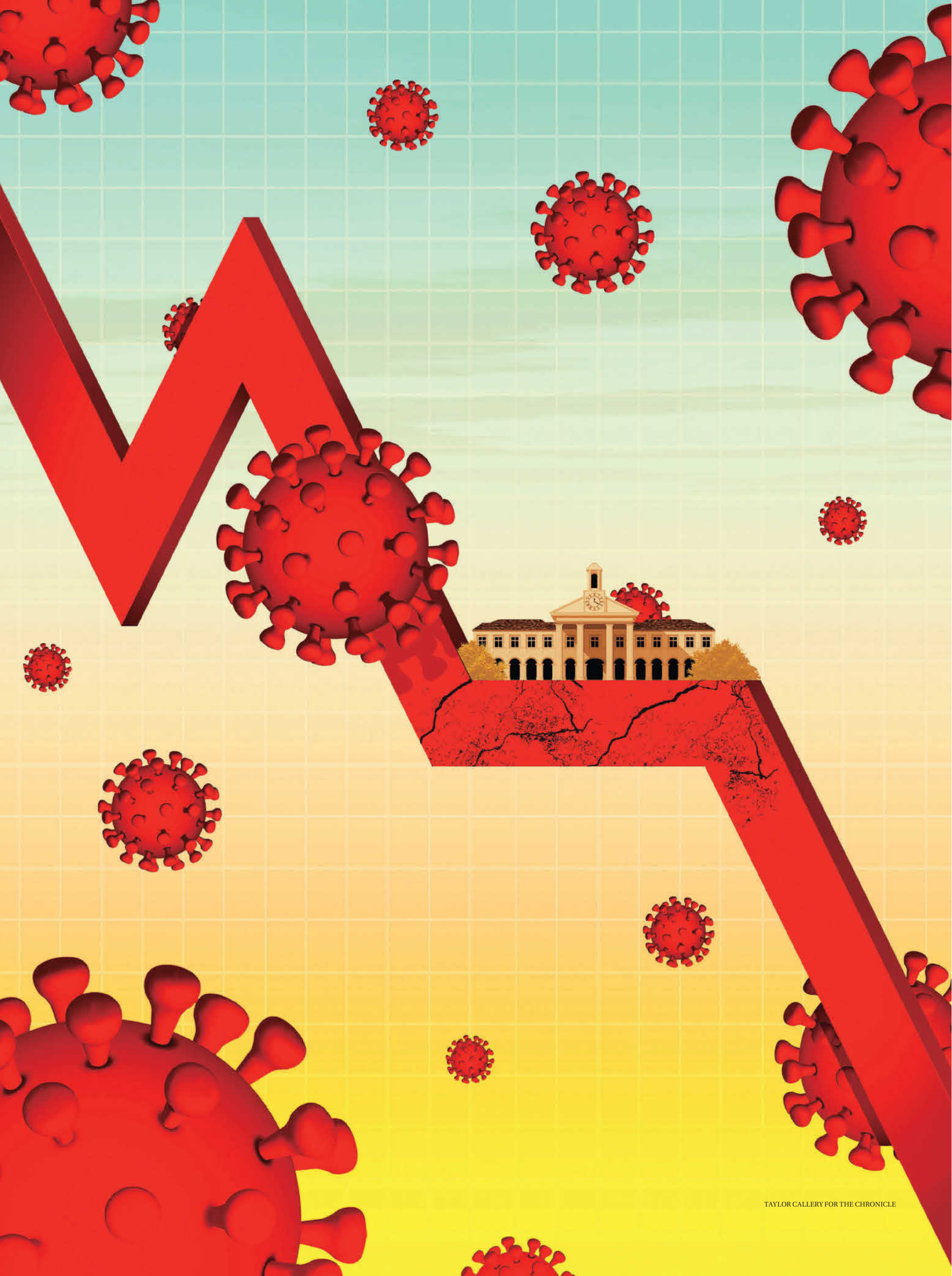


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How Much Has Covid Cost Colleges? \$183 Billion

The financial situation is dire. But colleges that stay focused
have a fighting chance.

BY PAUL N. FRIGA

WHAT A YEAR. Higher ed came into 2020 facing its share of financial challenges: a negative outlook for the entire sector, widespread operating deficits, stark enrollment challenges. Enter Covid-19, along with its attendant declines in enrollment, net tuition, and auxiliary revenue — to say nothing of Covid-related expenses.

How bad is it? To answer that, my colleagues and I sought to go beyond surveys. We conducted an extensive review of publicly announced revenue and budget news from the top 400 universities in *U.S. News & World Report*, as well as its top 100 liberal-arts colleges, drawing from news released from March through December. We were able to obtain data from 107 of those institutions (21 percent). The results are dire. Our research suggests that we are experiencing the biggest financial losses our sector has ever faced. The institutions we tracked averaged an estimated 14-percent aggregate decline in revenues across the 2020 and 2021 fiscal years, and further losses loom as drops in enrollment, tuition freezes, and Covid-related expenses continue.

The 14-percent average revenue-decline estimate may even be overly optimistic: Many state legislatures have not yet adjusted higher-education budgets to account for the new reality. Among those that have, the early signs are not positive. The University of Nevada at Las Vegas has seen a 20-percent decline in state support. The University of Missouri at Kansas City has seen a 12-percent decline. The Colorado legislature went as far as to cut higher-ed funding by 58 percent (though federal money eased the blow and the governor is aiming to restore funding this year, but who knows how that will shake out?).

What do those cuts and losses add up to? We estimate the impact as follows: \$85 billion in lost revenues, \$24 billion for Covid-related expenses, and \$74 billion in anticipated future decreases in state funding. That adds up to a whopping \$183 billion.

A few caveats: Our data are early estimates of financial impact with a focus on revenue losses and Covid expenses. The actual numbers will not be known until the 2021 fiscal year concludes — typically, the end of June. And those numbers will change over time as new publicly announced estimates emerge. (In cases where revenue losses are not broken out from the anticipated budget deficit, we assumed revenue loss as 78 percent of that total budget deficit, based on the ratio reported by the Association of Public and Land-Grant Universities, in turn based on fall-2021 results.) Total hits to budgets will be contingent on final revenue impacts and cost-reduction efforts.

At America's more than 4,000 colleges, there is certainly diversity in strategy and student composition, but the sources of revenue are fairly consistent across institutions: tuition, government support, endowment returns, auxiliary operations, and philanthropy. Unfortunately, all five of those sources are under great pressure because of the pandemic.

THE REVIEW

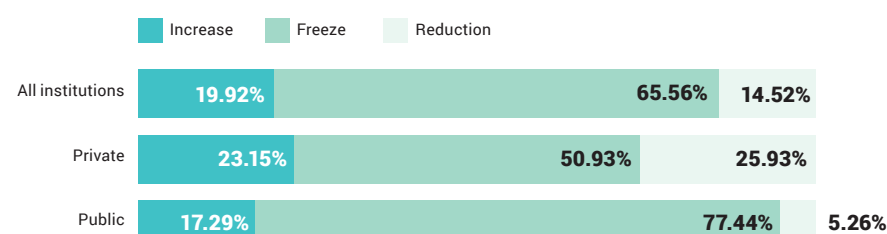
A decline in net tuition is due to lower enrollments and increased discounting, which is on the rise as colleges — especially small and medium-size private colleges — struggle to maintain enrollments. Decreases in the number of international students (who often pay full tuition) further exacerbate the net-tuition picture. State-government support is declining as a result of lower tax revenues and increased health-care costs.

Endowment returns, thankfully, are so far holding steady or increasing, but the underlying conditions of our economy suggest that continued growth in 2021 is far from certain. One of the areas hardest hit, especially for large institutions with significant numbers of students not on campus, is auxiliary revenue. This includes losses in housing, dining, other spending, and especially athletics.

One small silver lining: While early indications suggested fund raisers would struggle to meet their goals, recent market performance may have buoyed those concerns. Still, while endowments can contribute to a university's operations, they are not typically a source to fill short-term financial losses.

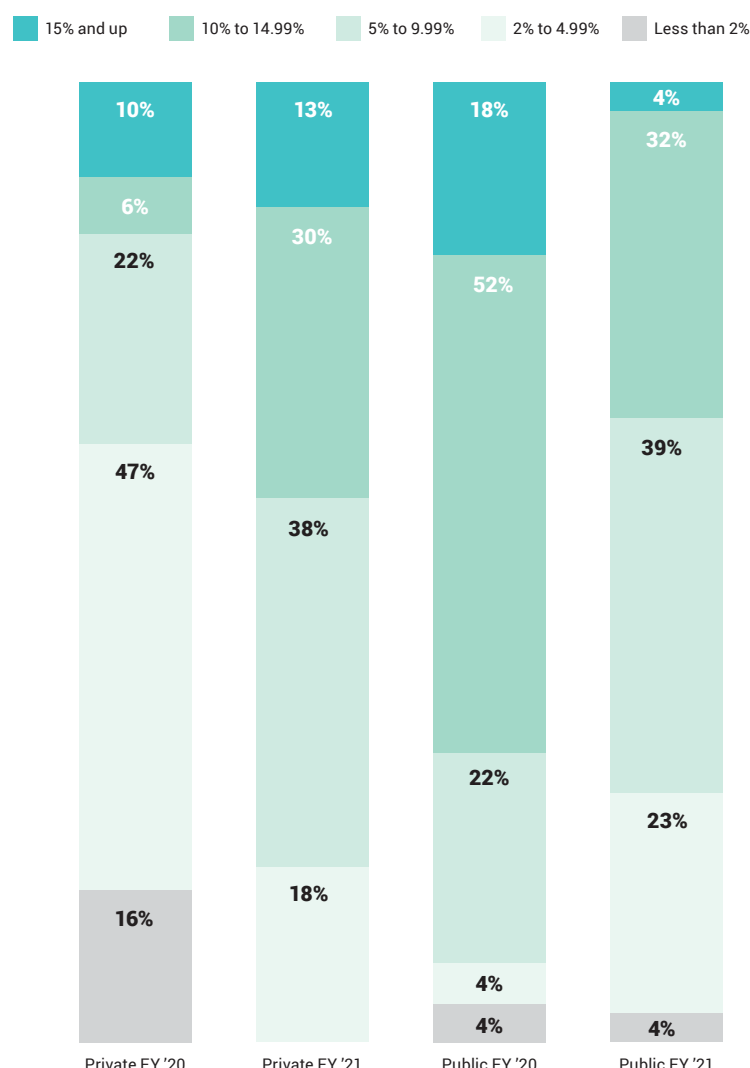
Most Institutions Have Frozen Tuition

The percentage of selected institutions that have reduced, frozen, or increased tuition, by institution type.



The Loss of Revenue Is Significant

The percentage of selected institutions that have seen the following estimated bands of revenue loss, by type (revenue loss as a percentage of 2018 revenue by fiscal year).



Note: Population for analysis included top 400 universities and top 100 liberal-arts colleges according to U.S. News & World Report.

Source: HelioCampus analysis

TUITION-PRICING STRATEGIES vary widely, but the majority of institutions seem to be holding tuition steady — which is in essence a decrease, given inflation and the traditional annual increases in tuition of 3 to 5 percent over the past decade. Shown at left are the data from our research on announced changes in tuition. Interestingly, 26 percent of the private institutions in our study have actually announced tuition decreases. Reasons cited for such decreases and freezes include concerns about losing students because of campus closings and the possible lower perceived quality of remote instruction.

At Georgetown University, for example, David Green, the chief financial officer, described the rationale for a 10-percent reduction in tuition: “Despite potential significant financial headwinds, we felt that we needed to do what we could to help our students and their families. At the same time, we are working hard on finding cost-saving opportunities, as you cannot just keep increasing spending each year; it is unsustainable.”

Zooming out to include the other factors, our research suggests an average drop in revenue of approximately 5.5 percent in the 2020 fiscal year and 8.6 percent in the 2021 fiscal year. The private institutions in our study are experiencing much more severe drops in revenue, with an average of 10 percent expected in the 2021 fiscal year versus 7 percent in public institutions.

AND YET, there is still hope, especially when it comes to federal assistance. Colleges have learned not to count on such funds to fully rectify strained budgets, but every little bit of federal funding helps. The Cares Act, passed in March, provided \$14 billion to institutions, with about half going to student aid. In December, Congress enacted more aid for higher ed — an additional \$23 billion, again with about 50 percent designed for student grants. And \$35 billion more for higher education is included in the early drafts of the new \$1.9-trillion stimulus package, half of which would go to colleges (a GOP counterproposal would leave higher ed out).

In sum, we are looking at \$19 billion to \$37 billion in support for higher-education institutions, with a matching amount for students, depending on the passage of the Biden proposal. If colleges incur the estimated \$183-billion loss suggested earlier, that would leave a shortfall of \$146 billion to \$164 billion. No wonder the higher-education lobby is asking for more. (The latest APLU request is for an additional \$97 billion.) It's crucial that we view any additional aid as an investment and not a bailout, and strategically plan for the funds as well as for the accountability that will come with them.

With a potential gap of around \$150 billion, we have a lot of work to do, and among the highest priorities for all colleges this year has been cost containment. “Higher ed has been feeling financial pressure for many years, but is only beginning to tinker with the underlying business model,” says Kasia Lundy, partner in the higher-education practice at EY-Parthenon. “Covid-19 has accelerated the financial impact to a point where institutions are forced to address budget shortfalls and operating-model changes more holistically and much faster than ever before.”

Academic leaders have shown an unprecedented nimbleness in adjusting operations to the pandemic, from the drastic shift to remote learning to new campus protocols for Covid safety. Scenario planning has become common cabinet nomenclature as universities model varying levels of financial strain.

And yet, while this is all promising, boards and campus leaders need to push harder for long-term changes in our operating model. Quick solutions such as increasing debt may help with cash management but will not bring about long-term fiscal sustainability.

The most common cost-control strategies are short term: Our research reveals that 75 percent of institutions have instituted hiring freezes, a sharp shift from the annual growth in personnel that had been routine. Half of the campuses we studied have required furloughs. No-travel policies, cuts in benefits, and elimination of on-campus events and purchases have also helped curtail spending. Fifty-two percent of universities we researched have cut pay for leaders and staff members, and more than 38 percent have an-

nounced delays in capital-spending projects. (It is likely that many more have done that but not disclosed it publicly.)

My home institution, the University of North Carolina at Chapel Hill, is rolling out many of those strategies with a goal of freeing up 3 percent of personnel costs and 15 percent of operating funds over the 2020-21 and 2021-22 fiscal years. The university has identified \$100 million in structural deficits to fill, in addition to a \$200-million gap directly related to Covid-19. "It is the responsible thing to do for the future of the university," explained Chancellor Kevin Guskiewicz at a recent faculty-and-staff meeting. The budget-reduction efforts will be developed collaboratively; will work to avoid blanket, across-the-board cuts; and will examine all options, including reducing the number of senior administrators. I applaud such a clear-eyed approach.

And yet few institutions are tackling those difficult, long-term cost-containment challenges. The higher-ed work force has shrunk by 337,000 to 500,000 since the pandemic began, though the majority of those losses appear to be temporary furlough arrangements. According to our research, only 38 percent of institutions have announced formal layoffs. Other likely strategies include delays in filling open positions, early retirements, and voluntary separations. All of that is painful, but it may be necessary in certain cases.

HIGHER ED IS HURTING. Our entire operating model is under siege, the revenue losses are unprecedented, and campus leaders are beginning to respond to the historic challenges. They are realizing that cost cutting alone is not the answer, and that this is a time to clarify their institutions' unique value to their students and communities.

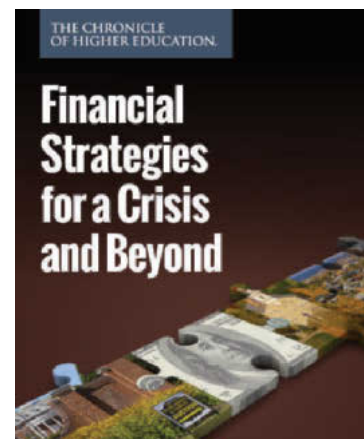
Morgan State University is adopting a "cut-and-grow strategy." As Sidney Evans, the chief financial officer, put it to me, they are not leaving any stones unturned:

"We have been very aggressively tackling a 15-percent operating-budget deficit, or about \$40 million on the \$270-million budget. We are making great progress with our full-court press on administrative and academic spending in order to free up cash to invest in our journey to become the first HBCU R1 University. Even with our game-changing recent philanthropy, we plan to continue our cost-containment efforts."

Leaders should pursue a relentless effort toward cost containment that includes regular, recurring process analysis and evaluation. Campuses should also pursue areas of strategic investment for the long term: Offer new academic programs, especially online, to offset discontinued programs identified during the cost-cutting efforts, for instance.

We will succeed only if we work together. This includes institutions and governments, boards and cabinets, and faculty and staff members. Only such collaboration will help us do the near impossible: Transform higher education for the better amid a pandemic. ■

Paul N. Friga is a clinical associate professor of strategy at the Kenan-Flagler Business School at the University of North Carolina at Chapel Hill. He also co-founded ABC Insights, a consortium of universities working to become more efficient and effective, which was acquired by HelioCampus this year.



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Enrollment Managers Are Flying Blind

Almost all the instruments colleges would normally use to predict the fall are broken.

I FIND MYSELF thinking often about a scene in John Osborne's 1956 play *Look Back in Anger*. Alison says to her father, Colonel Redfern, in reference to her husband, Jimmy, "You're hurt because everything is changed. Jimmy is hurt because everything is the same. And neither of you can face it. Something's gone wrong somewhere, hasn't it?"

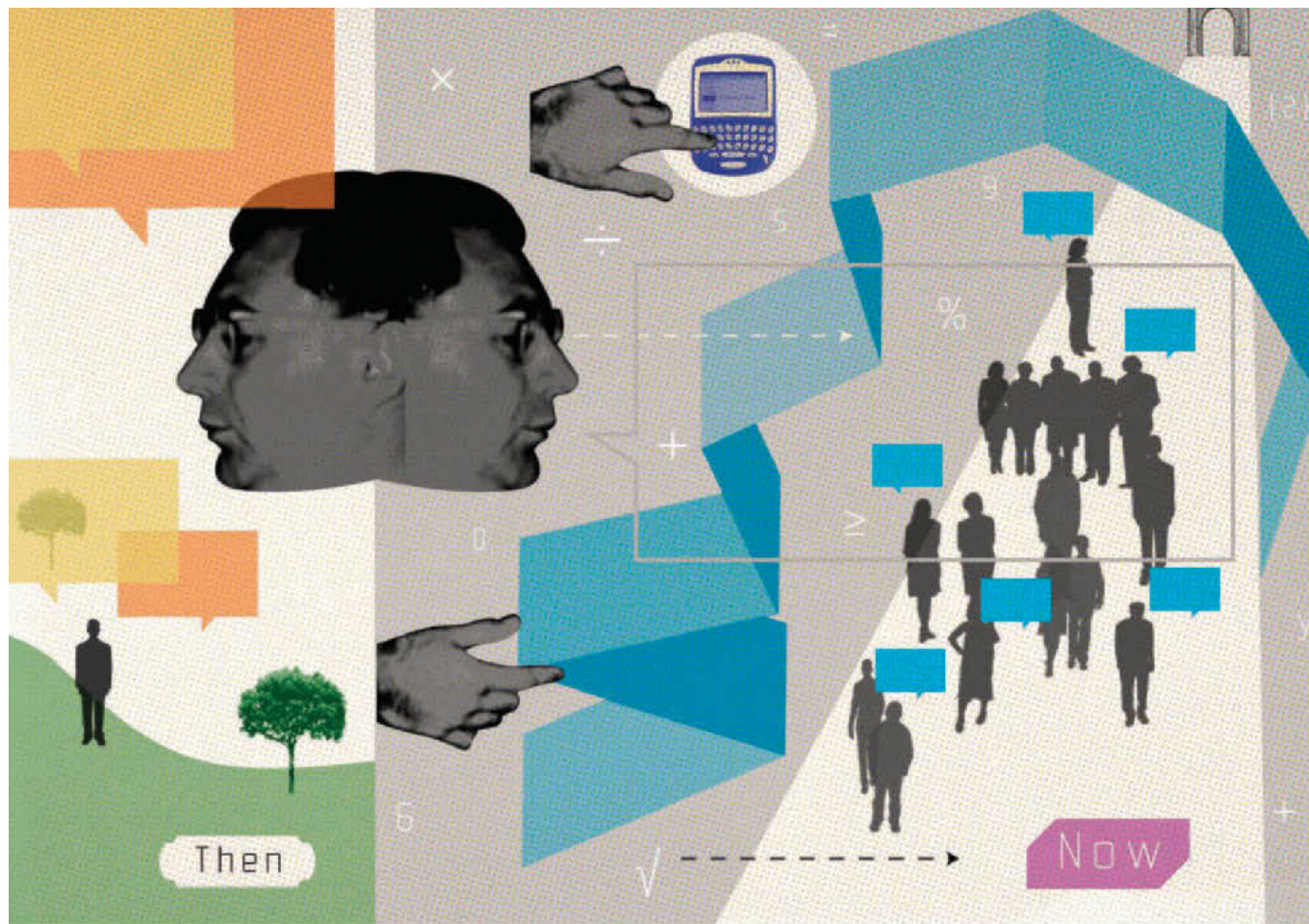
As we all know, a lot of things have gone wrong this year, and many more things have changed. But what's complicating everything is that one thing remains the same amid the chaos around us, and those of us in enrollment management are facing it this spring: the belief that we can predict next fall's enrollment seven months out, as usual.

At this time of year, it's customary for people in my job to talk to chief financial officers, academic planners, presidents, provosts, deans, boards of trustees, and staff members in campus housing to get a sense of what "the number" will be. This year the one thing most in demand is clarity: Now that things will return to normal, how close will our enrollment be to normal? Our habits, customs, and practices make that question seem, well, normal.

Unfortunately, what's changed is almost everything we try to use to predict what fall will look like, and that's causing a lot of restless nights and a foreboding feeling akin to watching a Hitchcock movie: Everything looks as it should, but there is a sense that something is just not right. It's a feeling you find yourself unable to explain.

As I talk to colleagues around the country it's clear we all see it, and like people watching that Hitchcock film, we're all wondering when the suspense will be broken, or if the plot will suddenly turn in an unexpected direction. For now we can just try to pick up clues.

Harvard is up 57 percent in fresh-



STUART BRADFORD FOR THE CHRONICLE

man applications from last year; Colgate has more than doubled its applications; and UCLA and UC-Berkeley have both blown past the 100,000-application threshold. The takeaway is that the institutions near

the top of the food chain will probably be just fine, as always. Even if they don't nail it the first

time, they have long wait lists to fill in gaps in their enrollments.

What I hear, though, from smaller public universities that get less attention (often those with a direction in their name) is that this year's applicant pools are down, by at least a little, maybe a lot. Private colleges outside of the bragging categories in *U.S. News & World Report* also appear to be feeling the sting.

Even well-known, large public research universities, like my own, that

seem to be having a very good year in freshman applications have to wonder if maybe those increases are coming from students who have scaled back lofty dreams or who are simply hedging their bets. What if, we wonder, student behavior actually returns to normal after a very abnormal admissions cycle? Do those applications evaporate when it comes time to make a decision in May, when students will have the benefit of some improved glimpse of the future?

ALL DATA POINTS in our world are connected, of course, and my peers and I have created perfectly plausible explanations for these trends: The Ivies are up because lots of students with good but not great SAT or ACT scores have been convinced that they have a better shot since standardized entrance exams have been abandoned or postponed; the same logic that causes peo-

ple to buy two lottery tickets because their chances double might be driving those meteoric application increases. It's also fair to note that there are always outliers: By my calculation, at least 200 colleges between 2002 and 2019 had at least one year with an application increase of 100 percent or more.

Further, we say, applications are down at colleges that serve first-generation, low-income students because those students are most affected by financial downturns. In an economic crisis, college becomes a luxury some people cannot afford or even envision, and data on Fafsa completion and applications to the Common App seem to validate the disproportionate impact we've all sensed for months.

We could be wrong, and we might not know the future until it happens. Bringing in a class is like landing a fighter on the deck of an aircraft carrier.

THE REVIEW

er. At night. On rough seas. But in our case, all the power we push to the engines, all the minor changes in speed and direction, all the adjustments for unpredictable cross winds are made and programmed months before we go on final approach.

Faced with landing that jet, you want a very experienced pilot with great instruments.

Did I mention our instruments are broken? Because they're broken.

Almost all the things we would normally use to try to predict what fall will look like are gone. For instance, we try to measure affinity for our institutions. If you're moderately selective, you look at the group collectively to see how many students have visited campus during open-house events, how many spoke to an admissions officer at college fairs, how many showed up at a high-school visit. If you're highly selective, you may allocate individual slots to students based on those criteria. Those data points are mostly nonexistent this year.

Even academic factors like GPA or class rank, and pseudo-academic factors like the SAT or ACT, are less reliable. Standardized tests, while adding almost nothing to an admissions officer's ability to predict an individual student's academic performance in college, did offer some insight into yield rates, because society has long believed in the value of the tests. That belief drove application patterns, it drove expectations, and it drove entitlement via both admissions and net price, as it was also frequently used by colleges in allocating institutional aid and scholarships. As test-optional and test-free admissions take hold, that variable, too, is lost.

Academic performance, as measured by course rigor, GPA, and class rank, has always been the most predictive of a student's college success, and while we still have those, they are far less meaningful this year because of different blends of face-to-face, remote, and blended instructional modalities. Even grading scales and approaches over the final three high-school terms of this year's graduates are hard to decipher: Some districts gave everyone an A; others went to pass/fail; some maintained the status

quo; and still others allowed students to choose.

All of those factors — important in deciding whom to admit and how many will enroll next fall — are less meaningful this year. There may be downstream effects, too, in the academic performance of students who are thrown in the deep end of the pool without sufficient high-school preparation. Add the difficulty teachers and counselors must certainly have had in writing letters of recommendation for students they know only through Zoom, and the disruption of students' out-of-class activities that are important to their emotional and physical well-being, and it's easy to understand how even admissions decisions — let alone yield projections — are more challenging this year.

We know that not every student who is admitted will enroll, of course. The "yield rate" (the percentage of admits who do enroll) determines the size of your class. Your yield is partly based

Even academic factors like GPA or class rank, and pseudo-academic factors like the SAT or ACT, are less reliable.

on whom you admit; and how many and whom you admit are based on your projected yield. This is the great paradox of admissions and enrollment management; one variable is always unknowable yet necessary to solve the equation.

Our business deals with the whims of the market and students who move like flocks of starlings at sunset: flying in unison with no discernible cause or prompt. Like Donald Rumsfeld, what scares us the most are the things "we don't know we don't know," as well as the things we see but cannot yet understand.

Clearly, this is an institutional challenge, just as Covid is a national challenge. Getting through it is going to require an appreciation of the complexities that are writ large this year, an abandonment of our comfort with the tried and true, and some trust that we're all doing the best we can. ■



Jon Boeckenstedt

is vice provost for enrollment management at Oregon State University.

Why Haven't More Colleges Closed?

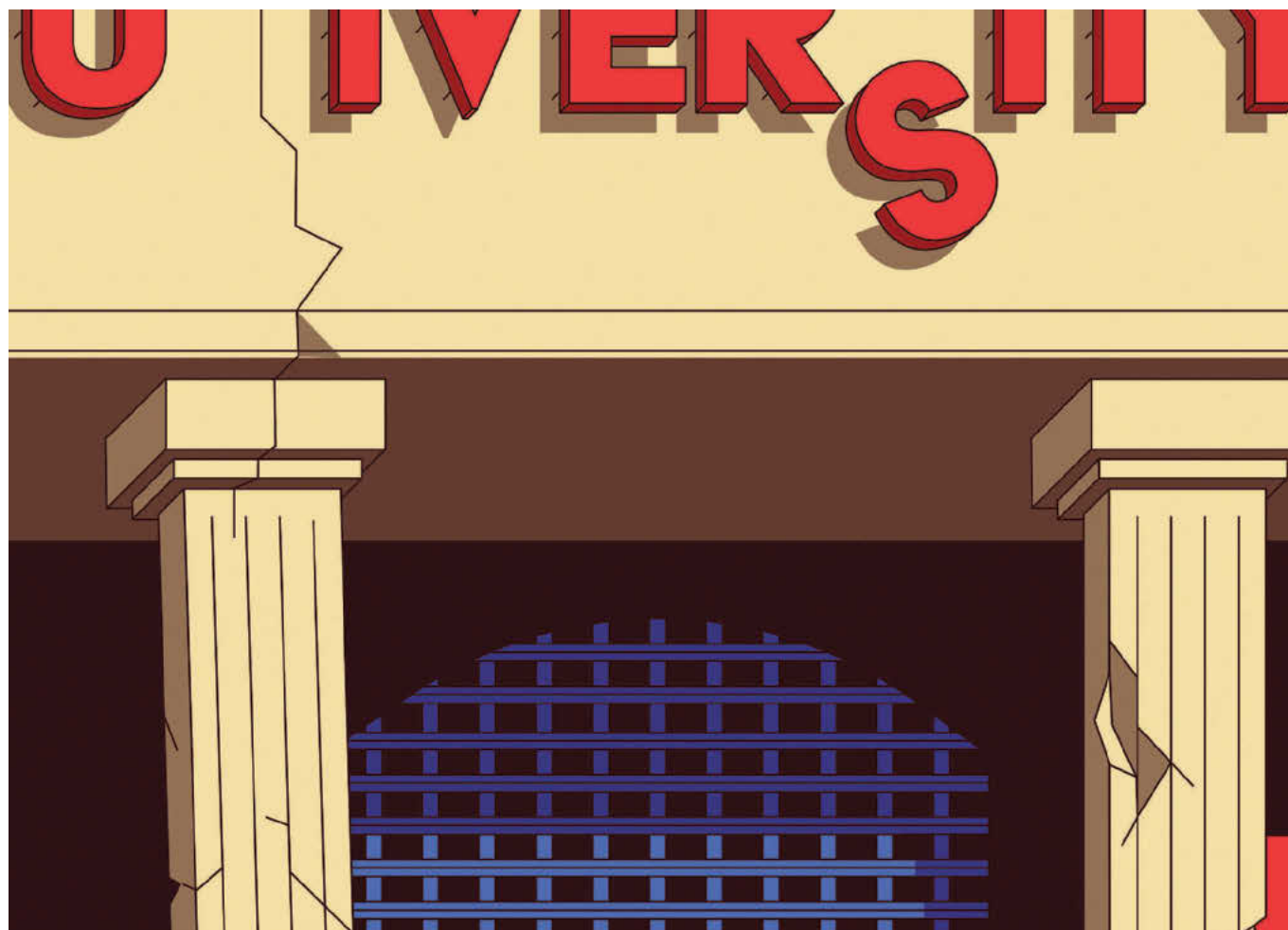
Prognosticators predicted mass shutterings. That hasn't happened.

LAST SPRING'S abrupt, pandemic-induced pivot to virtual learning led to tremendous financial disruption for colleges. The educational technology came with a lofty price tag. So did retrofitting campuses to comply with public-health guidance, with needs for plexiglass dividers, extra campus cleanings, and personal protective equipment — to say nothing of smart-phone screening apps and the cost of Covid-19 testing itself.

There were housing refunds to process, reduced revenues from flat or even decreased tuition pricing, and widespread enrollment declines. State governments threatened enormous funding cuts, and sometimes followed through, exacerbating a troubling pre-pandemic trend. The economic losses have been steep — one estimate comes in at \$183 billion — and although the federal government has provided stimulus funding, with more likely on the way, the amount seems certain to fall far short of the \$120 billion advocates sought.

Observers were quick to grasp the enormity of Covid's effects on our sector. Last March, Moody's Investors Service downgraded its financial outlook for higher ed, citing the pandemic as a cause for the change. In the pages of *The Chronicle* and elsewhere, experts like Robert Kelchen, Robert Zemsky, and William R. Doyle sounded dire notes. Existential perils loomed, it seemed; mass college closures appeared imminent. Zemsky told *The Wall Street Journal* in April that the toll could be as high as 200 closures in a year. In *Forbes*, Richard Vedder wrote that more colleges were vulnerable to closure now "than at any other time in American history" in an article headlined "Why the Coronavirus Will Kill 500-1,000 Colleges." Last January, John Kroger, a former president of Reed College, predicted 100 small-college closures over the course of a decade. By May he had revised that estimate upward: "More than 750 to 1,000" such colleges would now "go under."

Two hundred closures, 500, 1,000 — the predictions steeled us for the worst. So what has the cost been so



HARRY HAYSON FOR THE CHRONICLE

far? How many colleges have shuttered?

Ten — at least that's the number of permanent closures or consolidations from the beginning of March 2020 to the end of January 2021, according to *Higher Ed Dive*, which has been track-

ing college-closure announcements. The prognosticators have been wrong, so far — off by factors of 10

or 20 or nearly 100, though in fairness, some predictions were for longer time periods.

Those 10 have been small, private institutions that were often in deep financial trouble before the pandemic. MacMurray College, in Illinois, said the coronavirus's disruptions were "not the principal reasons" for closure. Pine Manor College, in Massachusetts, began a phased two-year hand-off to Boston College to let current and incoming students avoid disruption. The Pacific Northwest College of Art is on track to become part of nearby Willamette University, in Oregon.

Those changes are lamentable for the faculty, staff, students, and administrators directly affected, but collectively they represent more of a glancing blow than the direct asteroid hit many pundits predicted. Why?

FIRST, a few caveats. For one thing, it's still early. A year is a short amount of time in the lifespan of colleges that have existed, in some cases, for centuries. Closures and consolidations often take years of planning to bring about. Also, the significant federal stimulus to colleges may be propping some up just for now, and a wave of closures is possible if such funding disappears. Still, the fact remains that the pandemic has not driven a large number of colleges past their breaking points, at least not yet.

Some of what's happening fits a longstanding pattern. Should the past year's predictions of doom remain off target, they will be in good company. Prognosticators like the late Clayton Christensen and Earl Cheit predicted the demise of large

segments of higher ed years ago, to no avail. As it turns out, colleges are remarkably durable.

In a 2017 article in the *American Educational History Journal*, the University of Memphis associate professor R. Eric Platt and colleagues observed that during the Great Depression, only about 2 percent of American colleges closed, and an even smaller share merged with other institutions. As the American Council on Education's Phil Muehlenbeck and Karina Pineda wrote in 2019, some of the institutions that struggled in the 1970s, including Boston College and New York University, are now among the nation's most well-regarded. In a November 2020 study, Robert Kelchen found that among private colleges with risk factors for failure, a wide majority were still operating four years later.

The story here is that American colleges are strikingly resilient: Even in extremely grim economic contexts, they rarely close — even when they have the sorts of risk factors associated with closure.

THE REVIEW

It is true that a large number of for-profit colleges (more than 1,000, according to a 2019 article) have permanently closed in recent years. As relative newcomers to the higher-education sector, for-profit institutions tend not to have the deep roots or many of the institutional trappings possessed by a lot of their nonprofit counterparts, which are factors in institutional longevity. Moreover, for-profit institutions have seen their enrollments rise substantially in recent months, indicating a possible turnaround for the sector that may prevent further closures.

WHILE INSTITUTIONS may survive, not everything about them will. Institutional evolution is an important part of institutional survival. That is, al-

ing with external firms that specialize in recruiting and serving international students.

Colleges have also reduced or transformed certain programs and practices in response to evolving environments — as well as to reduce their costs. For example, over the years, the proportion of tenure-line faculty members has declined, while the proportion of lower-cost contingent faculty members has increased. Colleges have also eliminated or restructured departments and degree programs to make their offerings more marketable to prospective students. In short, institutions have proved they are willing to make adjustments, reorganizations, and even substantial cuts to lower expenses and keep up with market demand. That willingness to adapt



Rebecca S. Natow

Rebecca S. Natow is an assistant professor of educational leadership and policy at Hofstra University.

“Before our very eyes we’re witnessing an enormous, slow-motion change.”

though many more institutions than expected are likely to survive the current crisis, they are also likely to adopt fundamental changes to adapt to resource scarcity, changing markets, and the new competitive environment. As Platt and colleagues have noted, colleges throughout history have survived economic and other crises by rebranding themselves, not infrequently following a merger of two or more institutions into one. For instance, two New Orleans institutions in 1930 merged to rebrand as Dillard University. More recently, Southern New Hampshire University rebranded itself from a small, private, regional college to a global distance-learning provider, enrolling more than 130,000 students.

Back in 1990, the economist David W. Breneman observed that liberal-arts colleges had expanded their curricular offerings in response to market pressure to adopt more “professional” degree programs, such as business, education, engineering, and health professions.

In recent decades, increasing numbers of colleges have developed fully online course offerings in response to changing market demands. Some colleges have entered into partnerships with business and industry to help increase enrollments, for example, by providing skills training for employees of corporate partners or by work-

has no doubt been a factor in keeping many colleges financially afloat.

Colleges have generally been reluctant to drift too far from institutionalized practices that have been embraced by the sector for ages, such as tenure. And with good reason: Organizational scholars argue that holding onto such practices provides institutional legitimacy, which can in turn bring more resources to an organization. However, as the examples described above demonstrate, colleges have shown a greater willingness to adapt to new circumstances than stereotypes about the sector’s rigidity and reluctance to change would suggest.

ALTHOUGH most traditional institutions will survive the pandemic largely unscathed, many will adapt to the post-Covid “new normal” by instituting new policies or programs and by eliminating others. For example, Stanford University recently eliminated 11 varsity sports programs; the University of Vermont terminated its entire departments of classics, geology, and religion; and the University of Nevada at Las Vegas recently announced the addition of a new graduate program in cybersecurity, to meet a growing demand for technologists. While being among the first to make such changes may invite shock and even resistance, the changes will most likely become

more accepted over time — part of the new normal.

Such changes are plenty painful. Sadly, higher education has already experienced a large number of cuts in faculty and staff employment in response to pandemic-related financial losses, both current and projected. Some institutions have cut back on employees’ retirement benefits. And as noted above, consolidations of two or more colleges have also been announced or are being considered. More cost-saving measures are likely to come, at least until college leaders have more clarity about the market demand for higher education in the months and years ahead.

Institutions are also likely to expand curricular offerings in post-pandemic high-demand fields, such as health professions and technology. Also, because colleges have invested so heavily in distance learning during the pandemic, expect them to continue to expand their online course and degree offerings even after the need for socially distant teaching subsides. Before our very eyes, we’re witnessing an enormous, slow-motion change: The academy is becoming a more frugal employer, a more virtual entity, and less of a home to the traditional liberal arts — again, extending trends that were already present before the arrival of Covid.

This, it seems, is change enough for now. If history is a guide, the vast majority of colleges will survive the current crisis, as they have survived many other difficult periods in the past. It will be up to us to ensure that higher-education institutions — in their post-pandemic, altered forms — remain true to the important missions of centering student learning, producing valuable research, and adeptly serving their communities. ■

What We've Lost in a Year of Virtual Teaching

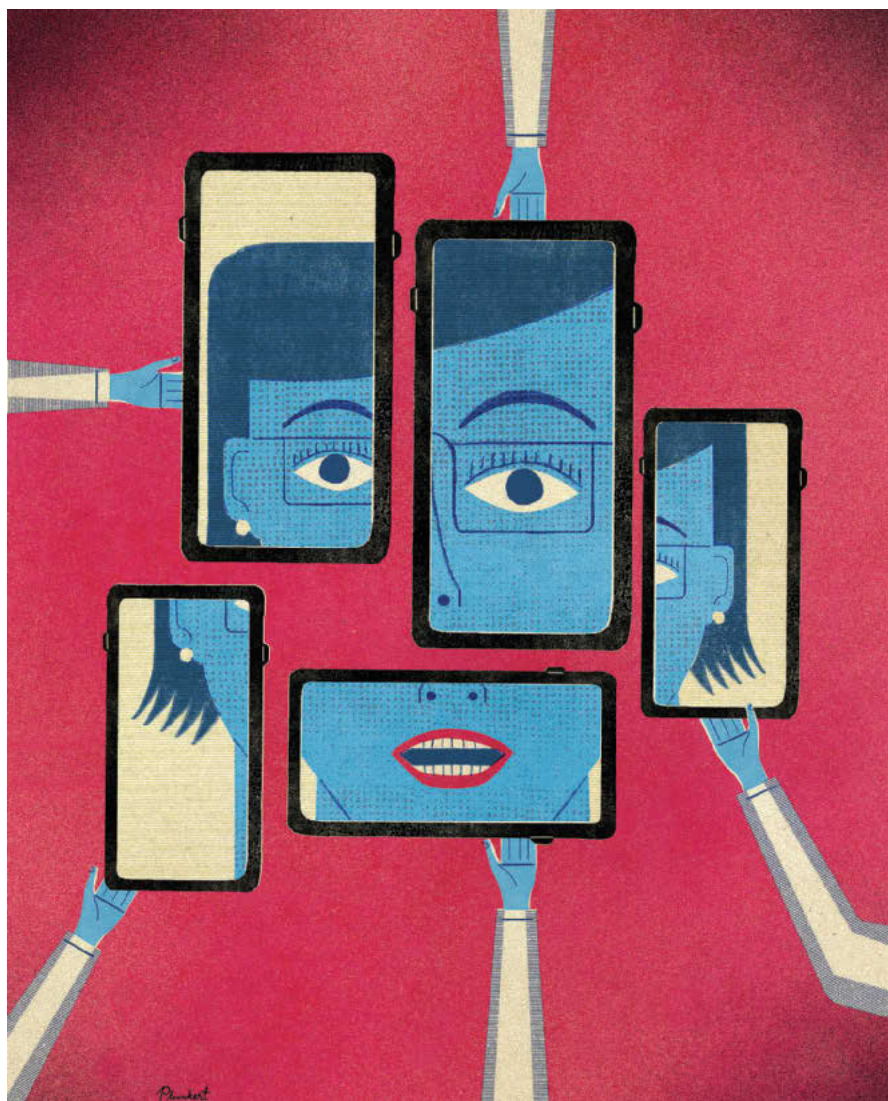
Our professional identity has suffered, and so have our students. But we've learned, too.

LATE IN 2020, I learned that there are two kinds of people in the world: those who have discovered the “Touch-Up My Appearance” setting on Zoom video calls and the rest of us — languishing in ignorance, unhappily bathed in harsh blue laptop light. If you weren't already aware of the soft-focus feature on Zoom, you might like to know that it has the “flattering” effect of blending your edges and correcting your complexion until you are rendered a smooth and poreless avatar, unrecognizable to yourself and your loved ones. I came to learn of it pathetically late in the game, although to be fair there's been a lot to learn lately.

Like everyone else, I've been busy coming to grips with our brave new Covid-19 world, figuring out how to navigate online teaching and socially distanced campuses. Will the changes that we've been compelled to make over the last year have lasting effects on college and university life? It's tempting to hope our adaptations are only temporary, but the nature of our profession may have been transformed while we were busy getting through the year.

Take, for instance, what you've been wearing to work. In 2017, I wrote about academic fashion for *The Chronicle Review*, lightly mocking our profession's pretensions and pointing out how what we wear signals status anxiety, income inequality, and other pitfalls of academic life. Who knew that I'd spend most of the last semester delivering seminars from my living room, barefoot and with a (mostly) clean sweater hastily paired with sweatpants? I certainly could not have predicted that my students would join me in London from time zones in Paris, Hong Kong, and Sydney, very often logging in from their childhood bedrooms. It's astonishing how quickly you become accustomed to seeing students bundled in robes or lounging in polka-dot onesies.

I don't blame them. There's a lot to be said for comfort dressing during quarantine, in the sense of not only being comfortable but also wearing the kinds of garments that might give us comfort, solace, or support when we're under duress. But the lapsed dress codes of our online teaching



DAVE PLUNKERT FOR THE CHRONICLE

platforms seem to indicate something else: a tacit agreement that in these unprecedented circumstances we can allow ourselves to let go a little. Professors are forgiven for pulling on yesterday's shirt for today's seminar. On Zoom and Teams we roll up our grubby sleeves, push up our glasses, and collectively exhale as we try, together, simply to keep life going. And perhaps we need to continue to allow this slack — this being kind to ourselves — in workplaces that have been hectic, high pressured, and unhappy not just for the past year but for decades now.

The result of all this has been a humanization of our work. Consider the virtual department meeting: We log on from home, variously wrangling poor internet connectivity, home-schooled children, over-affectionate pets, and the mail carrier

who seems to be continually banging on the door. Suddenly we see many of our colleagues as we haven't before. And there's a lesson in our comically housebound “professional” gatherings that isn't simply about how we should harness technology for productivity “going forward.” What we learn instead is that the veil between work and life has been rent. No, you will

never be able to unsee the sight of Professor X in his tartan boxer shorts when he gets up to answer the

door midmeeting — regrettably, that is now burned into your retinas. But you might also better understand the world from which he comes, the human errors of which he is capable, and the ordinary joys, obligations, and suffering to which we are all subject.

Individually, we have always known this. We've always wiped the baby spit-up from our blouses as we dashed

out the door, hurriedly paid the electricity bill on our lunch break, and ducked out of meetings to have time to grab a half-gallon of milk on the way home. We've always brought work home, grading on weekends and writing on vacations. In short, in academe work and home have never been separable. And so the shattering of our “professional” appearances isn't some dramatic revelation but instead a blow to a collective fiction we cherish about academic conduct. Where does that collective fiction come from? Perhaps we've generated it ourselves — a mythmaking that begins in graduate school and accelerates as our aspirations to work in an apparently dignified and noble profession deepen. But this self-mythologizing can be unforgiving. Before the pandemic, in our more self-serious moments, we pictured ourselves smartly dressed, striding purposefully across a manicured campus lawn, trailed by worshipful students — or else monastically secluded in book-lined offices, dedicated to deep thought. Now our dreams are more modest.

Occasionally, though, we lived up to those mental images. To my mind, dressing up was part of that fiction. The simple act of putting on shoes and packing a book bag would serve to apportion my day, convincing myself I was in “professorial mode.” These rituals are not superficial. We know now how undifferentiated life can feel without the usual accoutrements. Do you remember how a tie and collar could stiffen your neck and straighten your spine, beckoning from your body the rectitude required for work? Our clothes tell us we are at work; without such cues, we might find ourselves slumping into indolence.

BUT THE PANDEMIC is an opportunity to shift the conversation from individual efforts to achieve a professional identity to institutional efforts to aid us in that. In lieu of self-care, the conversation could now turn to our university's duty of care toward us, its labor force. What does it mean to properly achieve a work-life balance? Why do we hide our suffering and stress in the masquerade of seemingly effortless academic accomplishment? How could

THE REVIEW



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our employers have ever believed that we are simply brains and not bodies, too often tired from overwork and hungry because we didn't have time to grab a proper lunch?

Other things have changed as well. Crucially, it seems to me, our relationship with students has been recalibrated by the mediated nature of online teaching. It's been a challenge adapting course materials and teaching practices to virtual media, and yet I've found students to be patient and understanding about my relative incompetence. "You're on mute," they bellow, theatrically cupping their ears. "Have you tried switching it on and off again?" they type encouragingly, as the PowerPoint freezes. Teaching itself has become a more collaborative practice, in which students take the book learning I offer and give it form, color, and shape on virtual whiteboards they liberally pepper with images, commentary, hyperlinks, and yes, emojis.

The challenge is how to avoid producing just another video that makes their eyes glaze over (this, after all, is a generation of habitual screen watchers). We encourage their engagement with chats, commentaries, and other ingenious mechanisms. And behind those efforts is a new acceptance of the inadequacies of the lecture format and the unquestioned power dynamics by which silent, note-taking students dutifully ingest our words. The formalities of the student-teacher relationships we grew used to may be no more. A certain mystique is lost, I concede, when your students see your overfed cat trample your keyboard and knock over your chipped Bart Simpson mug. And it's simply

impossible to exit a Zoom lecture gracefully. Believe me, I've tried. After I painstakingly perorate on Plato, a virtual red-velvet curtain should fall with flourish at the designated moment and cue the applause. Instead, we mumble, "that's it," and awkwardly fumble for the mouse before the screen freezes on our half-gaping mouths.

It's at the moment when the screen goes blank and I'm left alone in my living room that I feel a pang. I remember all the other teaching, like when a timid student corners you at the end of a class or an eager one catches you in the corridor. Our work happens in spontaneous encounters — you remember that there's a book about exactly the thing this student is describing and it's right here, so you hand it over directly. There's something heartbreaking about the silent corridors and empty classrooms of the last year. The university may not always be pretty or well maintained, but it is designed to enable encounters between thinking beings in a real place and time.

Teaching is about an attunement to actual bodies in actual space. It's in the way we read the room for responsiveness or reluctance, adapting when we sense incomprehension, clarifying when we find confusion. It's also about rearranging desks, sharing marked-up essays, and peering into lab equipment. Our bodies teach as well: When we stand in front of students, explaining abstract ideas and responding to their curiosity, we are presenting them with an idea of how to be a grown-up person. Things might have changed, but some things are still sacred to us, still worth trying to hold onto — if we ever have the chance to return to normality.

I hope that some of the changes brought about by the pandemic will have lasting consequences for academic life. But there are fundamentals that we must not lose. I think of all the discarded coffee cups that litter our lecture halls, the coats that dangle on the backs of chairs in seminar rooms, the way that students elbow for room in studios and determinedly clutter all available table space, the security officers who wait patiently at entrances while we rummage for our passes, the books that need returning, and the office plants that need watering. And I remember that colleges and universities really are meant for the meeting of minds. ■

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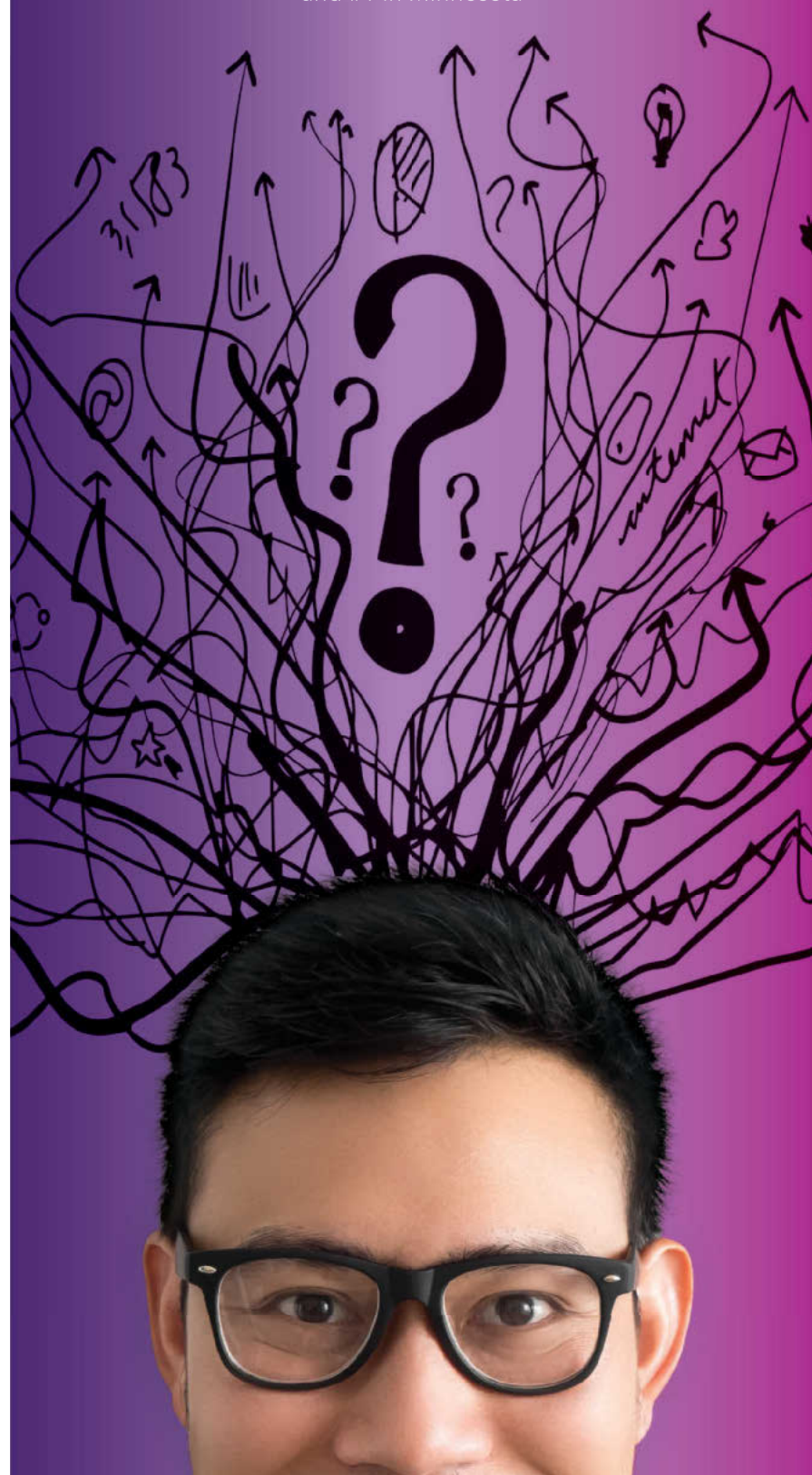
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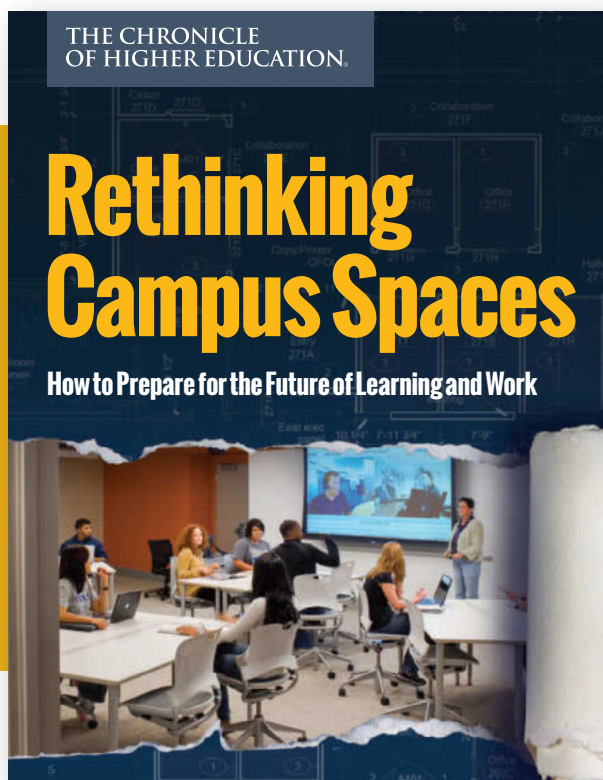
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The Chronicle spoke with academic leaders who have started to welcome faculty, staff, and students back to campus, after they abruptly emptied their grounds in spring 2020. Colleges and universities quickly transformed their spaces — removing chairs, putting up one-way signs, marking six-foot distances on the floors. But the quiet campus atmosphere and caution tape won’t last forever, compelling leaders to examine how to adapt their campuses to meet the new standards of social interactions.

Learn how and why campuses will look different, in subtle and obvious ways, long after the immediate public-health threat is over. As budgets get tighter for both colleges and families, many institutions share the steps they are taking to maximize in-person interactions in the future while still including a wider adoption of online work and learning.

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How to Manage Through Emotional Exhaustion

Those of us in academic leadership are not talking enough about mental health.

LAST YEAR was difficult for all of us in academe, and the start of the new year has proved challenging as well. Mental health and wellness are important components of workplace happiness and success, and those of us in management and leadership positions in higher education are not talking about that as much as we should. We're not talking enough about emotional exhaustion — defined by the Mayo Clinic as “when stress begins to accumulate from negative or challenging events in life that just keep coming.”

Let me begin by saying I am grateful to be employed. Beyond grateful. I am sure many of you feel similarly. However, being grateful does not mean you are OK. You can be both grateful and in a bad place. Every day, as you take calls, log into Zoom meetings, and write documents, you may be working through your own emotional exhaustion — and so are people working alongside you. You are going to falter. People on your team will falter.

Working and leading through turbulent times makes it nearly impossible to put your best professional foot forward, Monday through Friday. Sure, the work still needs to be done. You still need to hold teams accountable, ask for updates, and resolve problems. But if 2020 taught leaders anything, it's that our campuses won't succeed in the long term if we do not take care of the people we manage.

Leading through emotional exhaustion is not easy. It requires sophisticated soft skills. It means learning how to motivate your team, raise morale, and demonstrate empathy. It requires you, as a manager, to put aside your own feelings and focus on other people's needs. That can be difficult with a large team — especially if you are stressed and emotionally exhausted, too. And, honestly, taking on the energy of others is taxing (even more so if you are an unemotional person).

All of which is why I recently began practicing some unconventional leadership skills, aimed at balancing employee needs with my own. I share the most successful tips here, in the hope that they will inspire you to lead differently, too.

Say yes to crying. Crying is not a sign of weakness.



IMAGE BY CHENSPEC, PIXABAY

In fact, crying is a strength. Biologically, it is a physical demonstration that someone is affected by a person, place, or thing (positively or negatively). It is just as healthy as swearing, working out, eye-rolling, or meditating. It is just a different release.

ADVICE

Crying at work does not indicate someone is unprofessional or fragile. It demonstrates the simple fact that something someone said or did — or something in one's personal life — yielded a specific reaction. If crying is not hindering productivity and is not routinely happening in meetings or in class, I say let your employees cry. And make them comfortable doing so.

Admittedly, I am a crier. I am an emotional person. Does that annoy unemotional people? Sure. Does being emotional have its downsides? Absolutely. Some days, I wish I could just turn it off like a faucet. But emotional is how I do life, and the way I manage

is no exception. Here are some things I do to ensure my team knows tears are welcome:

- I make my (virtual) office a true safe space for emotional release. I am proud that students, faculty members, and other colleagues know they can put time on my calendar to “cry it out” with zero questions or judgment. Sometimes I give advice to the crier. Sometimes we have difficult conversations. Sometimes I say nothing at all. It depends on what the person needs. Regardless, my office is a well-known cry zone.

- I do my fair share of crying. And I am lucky enough to have close colleagues and friends who allow me to feel secure in releasing my emotions.

Sometimes leaders forget that a crying employee does not necessarily mean a sad one. Crying can be a sign of embarrassment, frustration, or happiness. Take me, for example. If I am crying at work, you

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can be 99 percent sure it is because I am incredibly frustrated and cannot find the right words to express myself. I work on this constantly, but that does not prevent it from happening on occasion. I mention this because it is important for us, as leaders, to try to understand the “why” behind an emotional reaction, instead of assuming people are fragile, unprofessional, or “incapable” of handling their emotions.

Crying can quickly evoke feelings of shame and loneliness in the crier, especially if it is ignored or assumed the person will “get over it.” Leaders who witness an emotional outburst should at least take the initiative to do a wellness check on that person. A simple inquiry may be all that is needed to turn a tough moment into a lasting work relationship. Here are some questions to ask a crying employee:

- “What’s wrong? Do you want to talk about it?”
- “I see this conversation is upsetting you. Can I ask why?”
- “I value working with you, and it’s hurting me to see you like this. How can I help?”
- “Hey, that meeting (or conversation) was difficult, and you were clearly upset. I want to understand why you reacted that way.”

But what if the crying is too frequent? What if it’s unrelated to work but is affecting an employee’s productivity? Sometimes permission to take a (temporary) break and deal with the emotion is the best gift you can give. But if an inability to manage emotions is causing a series of work-related problems (missed deadlines, complaints, making others uncomfortable, etc.), it’s your responsibility to tactfully confront the situation.

For the unemotional leaders and noncriers in the room: What if you are truly uncomfortable with crying at work? And really do feel as if it is inappropriate?

How you feel is not wrong, and you are entitled to your opinion. I would, however, offer this unsolicited consideration: If you oversee people, how can you do your job effectively if you cannot respect the way others process information? You do not have to like it, or do it yourself, but it’s your responsibility to manage the people in your department or office as individual pieces of a puzzle. They have different needs that require personalized management, or they will never be able to come together as one cohesive unit.

Focus on milestones, not moments. Most of us work eight or more hours a day. The other hours are spent with both mundane and heavy life stuff that we do not talk about at work. As much as we try not to bring our personal lives to work, sometimes we cannot help it. Emotions just appear, and usually at the worst possible times. These moments can present themselves as a rude comment, an “oh crap” mistake, or a moment of pure regret and embarrassment. We have all been there. Maybe in 2020-21, it’s happened more often than we would like.

As my dad always says, human beings are unpredictable. Thus, when someone reacts poorly or



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makes an uncharacteristic mistake, it is important to take a moment to look at the whole picture. Think to yourself:

- Is this person an asset to the team?
- Could this be just an unfortunate moment in time? Or is this consistent behavior?
- Is there any way I am responsible for this person’s reaction? Could I have delivered this information better?
- Do I need to deal with this formally?

Remember: A few bad days do not represent someone’s overall ability or personality. A few meetings where the tone of someone’s com-

ments is off do not make that a habitual problem. A few mistakes or absent-minded errors do not make someone a screw-up.

Yet as leaders, we often spend more time offering negative feedback — harping on mistakes — than celebrating all the things employees do right. And, sadly, that is understandable in difficult times, when we may focus on the negative because we are under pressure to “fix” things and we perceive our lives as negative. We may be more apt to nitpick or be hard on our employees because it makes us feel better. Or we become laser-focused on protecting our own jobs or reputation. The truth hurts. I know.

Let me be clear: I am not suggesting managers ignore repeated mistakes or avoid reprimanding employees if it is deserved.

What I am suggesting: We are in different times, and we need to think about why something is important to bring up now, and how we deliver the message. We all need fewer accusations, less defensiveness, and more listening. We need to avoid going into a conversation angry. We need to respect how others process information or events. Finally, we need to put empathy at the forefront of every conversation. Here are some ways to approach a conflict:

- “We need to discuss what happened, and it may be difficult, but I want you to know this incident does not reflect the person you are, and it’s not going to define you.”
- “I want to address the situation, but first, I’d like you to tell me your side and how you’re feeling. It may help me better understand where you’re coming from.”
- “We both understand the situation could have been handled better, and we need to discuss strategies to ensure this doesn’t happen in the future. But first, I want to take a few minutes to understand why you reacted that way.”
- “OK, I respect that you don’t want to talk about this right now. Why don’t you take some time to reflect upon what happened, and we can talk later this week? It’s important to me that we discuss this, but I understand you may need a little time to digest.”

A mishandled conversation between manager and employee can do a lot of damage, both immediate

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and in the long term. Once these feelings take hold, you risk someone’s becoming despondent, unmotivated, disengaged. In short, the employee becomes a product of the perceived negative environment. No leader can lose valuable employees right now. They are too expensive to replace.

Practice inclusive leadership. That term gets misconstrued all the time. Yes, it’s about living and breathing diversity, equity, and inclusion. But it’s also about more than that. Inclusive leaders are those who are people-oriented, understanding, and passionate, and are more socially savvy than procedure heavy. They inspire change, take the time to understand the jobs of those they manage, and are committed to the team’s emotional well-being. They are ride-or-die for their employees, and put the needs of others before their own. They actively listen more than talk, and ponder more than react.

In managing people, that means taking the time to check on how they are doing, not just what they’re doing. For example, I don’t micromanage my faculty’s day-to-day teaching (barring some specific reason to do so). But I do like to get into the weeds now and then, to ensure not only that team members are

delivering on excellence, but also that they are happy.

Of course, at times, I need to make difficult decisions and choices that leave employees downright unhappy. But, over all, I know my team is happy because I informally measure it. You read that correctly: I measure workplace happiness. Their engagement, body language, and participation provide me with important insights into team morale, potential burnout, and motivation to succeed.

While I am not an expert on workplace satisfaction, I have read enough to understand that happiness is feeling or showing contentment. At work, people exude happiness in a variety of ways. They do great work consistently, are flexible with change, are open to learning new things, and are forthcoming with information. They smile and are animated during meetings. They ask questions and feel comfortable raising concerns. They attend events and meetings, just to connect. They regularly ask for help, advice, or both.

If any or all of those traits are displayed, I can confidently surmise that employees are “happy” doing their jobs. Also it means they are conducive to my leadership style, which is a key variable in any

employee-happiness equation. When I started in my current role, I asked for a one-on-one meeting with every instructor. With a large roster, that took months. And it was worth it. It was important to me to understand all instructors’ personalities, what made them tick, and their strengths and weaknesses. On the flip side, I wanted to share my leadership style and expectations for the faculty. This exchange is inclusive leadership in practice.

Like it or not, being liked as a manager matters. The more people like and respect you as a leader, the better the health and happiness of the employee and the organization. After the pandemic, inclusive leaders will be more employable than revenue-driven or process-oriented ones.

I know my leadership style is not for everyone. I hide nothing. I talk about life with faculty members and students. I am open about anxiety, pain, and stress. We celebrate wins together. We follow one another on social media and connect outside of work hours. The point is: Being relatable and approachable as a human being, however you choose to do so, makes you a more respected and effective leader. Now is the time to show your heart, not just your head. ■

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Nonacademic hiring is very different from what a Ph.D. is used to, and there’s no shame in recognizing that you find it challenging and even infuriating.

So much of nonacademic hiring is done “off the books” that it can make the rules and systems of academic hiring seem quaint by comparison, despite academe’s many inequities. In talking with other scholars who have found nonacademic work, I sense that the back-channel hiring is far more prevalent in small companies and organizations than in large ones.

Get more career tips on jobs.chronicle.com

Erin Bartram, a Ph.D. and formerly a visiting assistant professor of history at the University of Hartford, is writing about her career transition out of academe.



Presidential Search

The Board of Trustees invites inquiries, nominations and applications for the position of President of Delta College, University Center, Michigan. The College is accredited by the Higher Learning Commission and enjoys full accreditation status. This leader will serve as the College’s fifth president in its 60-year history.

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- Align workforce training needs with the skills of graduates by working with community and business representatives.
- Establish a foundation of trust.
- Empower faculty and staff to work together to create pathways to success for every student.

Delta College was founded in 1961 to serve the residents of Bay, Midland and Saginaw counties. These three counties comprise the district for the College and, while part of the Great Lakes Bay Region, are distinct in their strengths and characteristics. The College is known for its strong community connections, industry-focused training programs, collaboration with local school districts and commitment to an inclusive and equitable campus. The College serves students on its main campus and at its downtown centers in Midland, Saginaw and Bay City. The 640-acre main campus also includes a residence that is available to the President.

For additional information, nominations, or confidential inquiries, contact:

Jill Wakefield, Ed.D. ACCT Search Consultant jwakefi777@comcast.net 206-234-6752 (mobile)	Julie Golder, J.D. Vice President of Search Services jgolder@acct.org 202-775-4466 (office) 202-384-5816 (mobile)
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Application target date: April 9, 2021

For detailed information, the Presidential Profile and information on how to apply please visit delta.edu or acctsearches.org

delta.edu/equity 20-166 (3/21)



PRESIDENT
ANNAPOLIS, MARYLAND

St. John’s College, often considered the most rigorous and contrarian liberal arts college in America, invites nominations and applications for the position of President of its Annapolis, Maryland campus. The position is expected to assume the collegewide Presidency over the college’s two campuses in June, 2023. The college’s Western campus is located in Santa Fe, New Mexico. This overarching search welcomes candidates capable of the deft leadership required to succeed in both positions.

St. John’s College plays a vital role in American education. The third oldest college in the United States, St. John’s is renowned internationally for its Program of Instruction, which anchors its community of learning in a pedagogical approach that joins Socratic inquiry and dialogue with the rigorous study of foundational and world-changing books that span 3000 years of the Western intellectual tradition; in addition, the Santa Fe campus offers a graduate exploration of the Eastern intellectual tradition.

With two beautiful campuses operating across the country in two historic capital cities, St. John’s campuses enroll a combined 800 undergraduate students, as well as 125 students in the Graduate Institute. By learning through discussion in seminars, laboratories, and tutorials, members of the St. John’s community are continuously immersed in a quest for a deeper understanding about the world and themselves. Students and alumni are colloquially known as “Johnnies” and pride themselves on their ability to consider antithetical ideas, to engage with civility across divides, to examine their biases, and to doggedly pursue truth.

Upon joining the college, the new President will lead the campus through an important transition period that will move the campus from great to extraordinary. To accomplish this, the President will be charged with raising retention rates while maintaining the highest standards of rigor; increasing student supports and strengthening career preparation programming; and preparing the college to successfully serve students of the future – who are increasingly diverse and often economically underprivileged. The President will also be a public face of the college’s \$300M Freeing Minds campaign. In addition, he or she must be deeply committed to St. John’s understanding of and commitment to the liberal arts and to the singular role that the college’s Program of Instruction plays in American higher education.

To effectively lead at St. John’s College, the President must meet the following goals:


- Lead St. John’s College, Annapolis through an important transition period that moves the college from great to extraordinary.
- Serve as a compelling and effective advocate for the mission and value of St. John’s College and its Program of Instruction, both internally and externally.
- Partner effectively within a complex management structure as Annapolis President.
- If appointed collegewide President: steward both campuses as the collegewide President, expected to begin in June, 2023.

St. John’s College has retained Isaacson, Miller, a national executive search firm, to assist in this search. Screening of complete applications will begin immediately and continue until the completion of the search process. For more details, including the full position profile and to submit inquiries, nominations, referrals, and applications, please see the Isaacson, Miller website for the search: www.imsearch.com/7867 Electronic submission of materials is required.

David Bellshaw and Emily Chiswick-Patterson
Isaacson, Miller
1000 Sansome Street, Suite 300
San Francisco, CA 94111
Phone: 415.655.4900

St. John’s College is an equal opportunity employer; candidates of all backgrounds are encouraged to apply.





Vice President for Equity and Inclusion

Gustavus Adolphus College in Saint Peter, Minn., invites applications and nominations for the new position of Vice President for Equity and Inclusion.

Gustavus aspires to be a community of persons from diverse backgrounds who respect and affirm the dignity of all people. The Vice President for Equity and Inclusion reports to the President and will lead diversity, equity, inclusion, and racial justice strategy and alignment across the College, chair the President’s Council on Diversity, Equity, and Inclusion, serve as the College’s ADA officer, and manage a team of professionals to advance this work that includes the Center for Inclusive Excellence, the Center for International and Cultural Education, and the Academic Support Center.

Visit <https://gustavus.edu/dei> to learn more about Gustavus’s campus-wide commitment to diversity, equity, and inclusion.

For the complete position prospectus and application instructions, please visit <https://gustavus.edu/jobs>



Department Head Position NC State College of Education

The NC State College of Education leads the way in North Carolina in preparing professionals, conducting research, and engaging communities to improve educational outcomes for all learners across the state and beyond. With two-thirds of its faculty grant active and over 120 funded research projects totaling \$90-plus million, the college ranks No. 1 in education research productivity in North Carolina and among the top 6 percent of colleges of education in the nation. During the 2018-2019 fiscal year, the faculty had half of their proposals funded and brought in over \$30 million in new funded research. They address society’s most pressing educational challenges and convert their research to action and innovative solutions that transform teaching and learning environments across the lifespan, with particular strengths in improving technology-enhanced learning and teaching in STEM education and literacy; increasing diversity, equity and access in education; and innovating leadership development.

The college is composed of three academic departments: Educational Leadership, Policy, and Human Development; Science, Technology, Engineering, and Mathematics Education; and Teacher Education and Learning Sciences, with approximately 124 faculty members and 92 support and professional staff. The college’s 1,700 undergraduate and graduate students study across 60-plus degree programs that deliver highly-engaged and personalized academic experiences that prepare them to lead in the field of education. The college is also home to the Friday Institute for Educational Innovation and the proposed Belk Center for Community College Leadership and Research.

We invite applications from prospective colleagues who will help us advance our mission and improve educational outcomes for the following position:

- Department Head of Educational Leadership, Policy, and Human Development**
For more information, email the Search Chair, Dr. John Lee, at john_lee@ncsu.edu
To apply: <https://jobs.ncsu.edu/postings/132394>

Salary commensurate with rank, credentials, education, and experience. The proposed start date is July 1, 2021.

To apply for this position, go to the link provided for the position. Required application materials are outlined in each posting and must be submitted using the online application. For more information, please contact the search committee chair listed above.

NC State University is an equal opportunity and affirmative action employer. All qualified applicants will receive consideration for employment without regard to race, color, national origin, religion, sex, gender identity, age, sexual orientation, genetic information, status as an individual with a disability, or status as a protected veteran. If you have general questions about the application process, you may contact Human Resources at (919) 515-2135 or workatncstate@ncsu.edu. Individuals with disabilities requiring disability-related accommodations in the application and interview process, please call 919-515-3148. Final candidates are subject to criminal & sex offender background checks. Some vacancies also require credit or motor vehicle checks. If highest degree is from an institution outside of the U.S., final candidates are required to have their degree equivalency verified at www.wes.org or equivalent service. Degree(s) must be obtained prior to start date in order to meet qualifications and receive credit. NC State University participates in E-Verify. Federal law requires all employers to verify the identity and employment eligibility of all persons hired to work in the United States.

JOB SEARCH TIPS

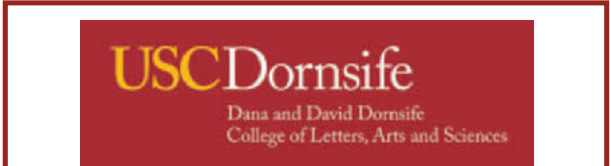
Becoming a full-fledged candidate for a leadership post means getting your name in the pool that matters.

Conventional wisdom holds that your CV is what gets you to the airport interview, and after that “it’s all politics and personal qualities.” That’s neither entirely correct nor entirely wrong. Getting into the right pool is based on both your record and on many unquantifiable factors.

Get more career tips on jobs.chronicle.com

David D. Perlmutter is a professor in and dean of the College of Media & Communication at Texas Tech University. He writes the Career Confidential advice column for The Chronicle.





Dean of Undergraduate Education, Dornsife College of Letters, Arts and Sciences

The Dornsife College of Letters, Arts, and Sciences seeks a vigorous, accomplished individual to serve as the College Dean of Undergraduate Education (CDUE). Working in close partnership with the Dean of Dornsife, the faculty, staff and students, the CDUE will offer compelling leadership, promoting the role and value of the liberal arts and sciences at USC’s largest school. As the academic, intellectual, and administrative leader of the undergraduate experience, the CDUE will foster a climate of academic excellence, creativity, and aspiration to ensure that Dornsife builds on its distinctiveness and embraces new opportunities to continue to define the attributes of a great undergraduate liberal arts education.

With direct responsibility for a \$7.5M budget, the CDUE will oversee more than 400 experienced and dedicated Research, Teaching, Practice, Clinical faculty and 87 staff members and will be responsible for setting priorities and allocating resources to reflect the most critical needs of the undergraduate program.

The search committee will be considering candidates with the following experience:

- A record of distinguished scholarly achievement and the credentials to be appointed at the tenured professor level in an academic department within Dornsife.
- Impactful and collaborative organizational leadership at a scope and scale commensurate to Dornsife.
- Classroom engagement revealing the soul of a teacher who enjoys and has thrived among intelligent, vibrant undergraduates.
- The opportunity to have demonstrated a clear commitment to diversity and inclusion.
- A track record of effective communication at the highest level.

For more information about USC Dornsife College, please visit: <https://dornsife.usc.edu/>

USC Dornsife College of Letters, Arts and Sciences is being assisted in this recruitment by the international leadership advisory firm Spencer Stuart. To submit comments, nominations, or applications, please send an email along with a CV and any supporting materials to the confidential address: DornsifeUndergradDean@spencerstuart.com

DEAN, YONG SIEW TOH CONSERVATORY OF MUSIC

The National University of Singapore (NUS) invites applications for the position of Dean, Yong Siew Toh Conservatory of Music (YST Conservatory).

Inspirational life-affirming music-making is at the heart of the YST Conservatory. Centered in one of the world’s most dynamic countries, the Conservatory is uniquely placed to offer a distinct and powerful contemporary Asian voice. Founded in 2003, the YST Conservatory has quickly established a reputation as Asia’s most exciting international conservatory by bringing together world-class faculty, students and facilities to develop excellence in instrumental performance and composition. Building on this strong foundation, the Conservatory has evolved over the past decade to become one of the world’s most distinctive music schools and has diversified its offerings to include audio arts, conducting and voice specialization, as well as pathways in production and engagement. Across its undergraduate, graduate and continuing education initiatives, YST Conservatory nurtures aspirant professional musicians while giving greater musical resonance in the broader ecosystem of NUS – a leading global university fostering excellence across a comprehensive spectrum of disciplines and seamless opportunity for cross-disciplinary enrichment.

Under the stewardship of Professor and Dean Bernard Lanskey over the past 14 years, the Conservatory has achieved outstanding milestones and evolved a distinctive identity that combines traditional artistic excellence with awareness of contemporary challenges and contexts. NUS seeks a visionary leader with a distinguished artistic and academic record to continue YST Conservatory’s dynamic trajectory. The successful candidate will have the experience as well as collaborative and operational skills required to innovate and lead the conservatory in a premier academic environment with strong interdisciplinary focus in education, performance and research. The successful Dean should also have an aptitude for fund raising.

The Search Committee welcomes applications and nominations of suitable candidates. Application materials should include a full Curriculum Vitae and a broad vision statement for the YST Conservatory. Applications, enquiries or nominations should be sent by email to:


Mr Goh Yew Lin
Chair, YST Conservatory Dean Search Committee

C/o Ms Verene Koh
Secretariat, YST Conservatory Dean Search Committee
National University of Singapore
University Hall, 21 Lower Kent Ridge Road
Singapore 119077
Email: verenekoh@nus.edu.sg

Closing date: 31 March 2021

For more information about the YST Conservatory and NUS, please visit <https://www.ystmusic.nus.edu.sg/>

*All nominations and applications will be kept in the strictest confidence.
We appreciate your kind understanding that only shortlisted candidates will be notified.*



Five endowed professorships dedicated to community engaged scholarship that creates a more just society.

We seek highly accomplished academic leaders who thrive as engaged scholars and public intellectuals, visionaries who identify and advance solutions to our most pressing challenges.

Watts professor of public policy

The Professor will demonstrate that through rigorous analysis and value-based discourse, we can collectively govern the polity in a way that builds prosperity for current and future generations.

Watts professor of community safety

The Professor will address the ongoing challenge of building, maintaining and operating institutions that treat all individuals fairly and humanely while pursuing the justice and security for which all communities yearn.

Watts professor of child well-being

The Professor will investigate, evaluate and disseminate innovative strategies to protect, cultivate and enhance the lives of all young people such that their human potential is affirmed and realized.

Watts professor of urban solutions

The Professor will lead the co-creation of transformative solutions that enhance the social, cultural, environmental, and economic well-being of communities and their members.

Watts professor of collaborative solutions for tribal prosperity

The Professor will advance the discovery, organization, transmission, and application of knowledge in the cultivation of solutions to tribal challenges and the advancement of tribal prosperity.

The Watts College of Public Service and Community Solutions is the nation's largest comprehensive public affairs college. With more than 8,000 students enrolled in bachelor's degree, master's degree and doctoral programs across schools of public affairs, criminology and criminal justice, social work and community resources and development, Watts College is a formidable

community of students and scholars dedicated to bettering the world through community engaged research and learning. This is a unique opportunity to help define the future of a new type of public service college – one dedicated to building more vibrant, equitable communities.



Watts College
of Public Service and Community Solutions
Arizona State University

Express interest in these positions at:
publicservice.asu.edu/endowed-professor-initiative



SCHOOL OF ENGINEERING AND TECHNOLOGY
INDIANA UNIVERSITY–PURDUE UNIVERSITY
Indianapolis

Assistant Professor with focus in Cybersecurity

The Purdue School of Engineering and Technology, Indiana University–Purdue University Indianapolis (IUPUI) invites applications for one tenure-track position in the Department of Computer Information and Graphics Technology with an anticipated start date of August 1, 2021. Applicants should have a strong record of research, show significant potential for establishing and sustaining an externally funded research program, be committed to teaching both undergraduate and graduate courses, and mentoring M.S. and Ph.D. students.

We are particularly interested in applicants whose research focuses on Cybersecurity. Applicants whose research applies Cybersecurity to existing School strengths, such as Intelligent Transportation, IoT, Artificial Intelligence, and other areas of intelligent systems are strongly encouraged to apply. A doctorate in Computer Science, Computer Engineering, Electrical Engineering, or a related discipline focusing on Cybersecurity is required by the start date of the position.

The Department of Computer Information and Graphics Technology offers several degrees, including a B.S. in Cybersecurity, an M.S. in Cybersecurity and Trusted Systems, and also participates in the Ph.D. program offered by the Department of Electrical and Computer Engineering. The Purdue School of Engineering and Technology at IUPUI has 7 academic departments with an extensive undergraduate and graduate degree portfolio, including numerous CAC, EAC, and ETAC of ABET-accredited B.S. programs. The School has over 3,000 students, including approximately 500 graduate students pursuing either M.S. or Ph.D. programs. More information about the School is available at et.iupui.edu.

As the state's premier urban research institution, IUPUI is committed to being a welcoming campus community that reflects and enacts the values of diversity, equity and inclusion that inform academic excellence. We seek candidates who will not only enhance our representational diversity but whose research, teaching, and community engagement efforts contribute to diverse, equitable, and inclusive learning and working environments for our students, staff, and faculty. IUPUI condemns racism in all its forms and has taken an anti-racist stance that moves beyond mere statements to interrogating its policies, procedures, and practices. We hope to identify individuals who will assist in our mission to dismantle racism so that everyone has the opportunity to succeed at IUPUI.

Applications must include a letter of interest, curriculum vitae, a summary of scholarship including teaching and research interests, and contact information for at least three references. Apply for this position at <https://indiana.peopleadmin.com/postings/10509>

Applications are welcome until the position is filled. IUPUI is an Equal Opportunity/Affirmative Action educator and employer and affords reasonable accommodations to persons with disabilities.

THE UNIVERSITY OF ALABAMA

College of Education

ANNOUNCEMENT OF POSITIONS

(Positions begin August 16, 2021)

TENURE-TRACK POSITION

Assistant/Associate Professor of Quantitative Research
Department of Educational Studies in Psychology, Research Methodology, and Counseling

NON-TENURE-TRACK POSITIONS

Clinical Assistant Professor of Quantitative Research
Department of Educational Studies in Psychology, Research Methodology, and Counseling

Clinical Assistant/Associate Professor of Instructional Technology
Department of Educational Leadership, Policy, and Technology Studies

Clinical Assistant/Associate/Professor, Associate Dean for Student Services & Certification
Dean's Office and Office of Student Services and Certification, College of Education

Further information about The University of Alabama is accessible at <http://www.ua.edu>. Information about the College is accessible at <http://education.ua.edu>. Questions regarding this position can be directed to Amanda Dobbins at ahdobbins@ua.edu.

Application Process: Please apply online at <https://facultyjobs.ua.edu>. Tenure Track or Non-Tenure Positions: A cover letter of application, vita, research philosophy statement, 3-year detailed research plan, official transcript with conferred Ph.D. or Ed.D. degree, two professional letters of recommendation, and sample of research publications are required to complete the online application process. See posting for details of application process.

The University of Alabama is an Equal Opportunity/Affirmative Action employer and the College of Education actively seeks diversity among its faculty and staff. Women and minority candidates are strongly encouraged to apply.



Linda and Bipin Doshi Professor Position in Chemical and Biochemical Engineering Department

Missouri University of Science and Technology
Rolla, Missouri
<https://chemeng.mst.edu/>

The Department of Chemical and Biochemical Engineering at the Missouri University of Science and Technology (Missouri S&T) in Rolla, Missouri is seeking outstanding applicants for a new Linda and Bipin Doshi Professor or Associate Professor position in one of the areas of drug delivery, biomaterials, biopharmaceuticals, tissue engineering, energy (including but not limited to renewable fuels, batteries and multiphase reactors engineering). Preference will be given to the best applicants who can contribute to the department's areas of strength related to drug delivery, energy, and multiphase reaction engineering, and with a B.S. degree in chemical engineering and a Ph.D. degree in chemical engineering or a related field at the time of starting the position. Competitive salary commensurate to qualifications of the candidate will be offered. A complete ad can be found at <http://hr.mst.edu/careers/academic-employment/>.

Further details on required and desired attributes, skills and characteristics of the successful candidate, and the department's vision and strategic plan, activities, and research may be found at: <https://chemeng.mst.edu>.

Missouri S&T's Department of Chemical and Biochemical Engineering, the campus, and the greater University of Missouri System are deeply committed to inclusion and valuing diversity. S&T has undertaken a number of initiatives to improve campus life and the work life balance of its faculty and staff (see <http://hr.mst.edu>). Missouri S&T seeks to meet the needs of dual-career couples.

Interested candidates should electronically submit their application consisting of: 1) a cover letter, 2) a current curriculum vitae, 3) a research statement, 4) a teaching statement, 5) a diversity statement, and 6) complete contact information for at least four references to Missouri S&T's Human Resources Office at: <http://hr.mst.edu/careers/academic-employment/> using Reference Number 00078420. Acceptable electronic formats are PDF and MS Word.

Missouri S&T is an AA/EEO employer and does not discriminate on the basis of race, color, national origin, ancestry, religion, sex, pregnancy, sexual orientation, gender identity, gender expression, age, disability, protected veteran status, or any other status protected by applicable state or federal law. Females, minorities, and persons with disabilities are encouraged to apply. The university participates in E-Verify. For more information on E-Verify, please contact DHS at: 1-888-464-4218.



Harvard John A. Paulson School of Engineering and Applied Sciences

Lecturer in Mechanical Engineering Design

The Harvard John A. Paulson School of Engineering and Applied Sciences (SEAS) seeks applicants for the position of Lecturer in Mechanical Engineering Design for the 2021-2022 academic year. The position is an annual (twelve-month) academic appointment with an expected start date of July 1, 2021. The position is for three years, with the second two years contingent on a satisfactory performance review during the first year.

We invite applications from individuals with broad experience and expertise in mechanical design.

Typical responsibilities include:

- Teaching or co-teaching the introductory mechanical engineering undergraduate course, Engineering Sciences 51: Computer Aided Machine Design, each semester
- As needed, serve as a section leader for the senior undergraduate engineering capstone design course, Engineering Sciences 100hf: Engineering Design Projects, each semester
- Participate in curricular planning discussions with other faculty and staff as it applies to engineering design education and hands-on, project-based courses
- Advise students on mechanical design projects, including those that may involve student organizations, student summer/winter break design experiences, etc.
- Hold office hours and work one-on-one with undergraduate students

Candidates are required to have a Ph.D. degree in Mechanical Engineering or a related field by the expected start date, should have proven design experience in mechanical engineering, such as CAD/CAM, machine design, mechatronics, materials, manufacturing, robotics, embedded systems, etc., and be able to demonstrate practical, hands-on experience. This position requires a strong passion for and commitment to working closely with undergraduate students.

Required documents include a cover letter; CV; a one-page statement of teaching interests including a description of teaching/advising experience and philosophy, and comments on any efforts to encourage diversity, inclusion and belonging, and names and contact information for at least three references. We encourage candidates to apply by **April 15, 2021** but will continue to review applications until the position is filled. Applicants can apply online at: <https://academicpositions.harvard.edu/postings/10094>.

We are an equal opportunity employer, and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability status, protected veteran status, gender identity, sexual orientation, pregnancy and pregnancy-related conditions or any other characteristic protected by law.



Mississippi College

A CHRISTIAN UNIVERSITY

MICROBIOLOGIST

The Biological Science department at Mississippi College, a small liberal arts institution, seeks a microbiologist for appointment as an assistant or associate professor. The department has an outstanding pre-medical program with approximately 300 undergraduate and 300 graduate students. Teaching expectations include microbiology for nurses, microbiology for biology majors and upper level courses in the applicant's field of expertise. While teaching is the primary responsibility, involving undergraduates in research is also expected. All faculty must be of the Christian faith.

Founded in 1826, Mississippi College, Clinton, MS, is a private, comprehensive University with over 80 undergraduate majors, more than 50 graduate areas of study and approximately 5,000 students. It is affiliated with the Mississippi Baptist Convention.

Review of materials will commence immediately and will continue until the position is filled. Candidate should submit a CV and reference contact information to Dr. Beth Barlow, Chair of Biology, Box 4045 Mississippi College, Clinton, MS 39058, or sent in Pdf format to email: bbarlow@mc.edu



SAGINAW VALLEY STATE UNIVERSITY

Saginaw Valley State University is a comprehensive university with more than 100 programs of study for its more than 8,000 students. Located on a suburban campus in Michigan's Great Lakes Bay Region, SVSU is committed to a supportive and empowering environment for students, faculty and staff. For five consecutive years, SVSU has been recognized as a "Great College to Work For" (2016-2020).

SVSU emphasizes undergraduate teaching and learning, and community-based research. SVSU earned the Community Engagement classification from the Carnegie Foundation for the Advancement of Teaching, a distinction achieved by only 7 percent of U.S. colleges and universities. By their senior year, 84 percent of students have engaged with community employers and agencies in internships, field placements or some other component of their academic preparation.

SVSU is establishing itself as a leader in STEAM education for the Great Lakes Bay Region, partnering with businesses, foundations and school districts to improve students' performance in math, science and the arts at the middle school, high school and university levels.

More than 70 percent of SVSU freshmen live on campus in student housing that has been rated No. 1 among public universities in the U.S. (2018-2020). SVSU fields 19 varsity sports at the NCAA Division II level. The average class size is 23 students. For more information, please visit our website, <http://www.svsu.edu>.

SCOTT L. CARMONA COLLEGE OF BUSINESS
Assistant Professor of finance

All faculty positions should begin by August 2021. All full-time faculty at SVSU are required to teach 12 credit hours per semester. Spring/Summer courses may be available.

Salaries are competitive and commensurate with qualifications and experience. Screening of applicants will begin immediately and continue until positions are filled. SVSU offers an excellent benefits package and retirement program. For further information about these positions and to apply, please visit www.jobs.svsu.edu. Interested applicants MUST apply online at www.jobs.svsu.edu.

*Saginaw Valley State University is an EO/AA employer.
Women and minorities are encouraged to apply.*



Mississippi College

A CHRISTIAN UNIVERSITY

Human Gross Anatomy Faculty

The Biological Science department at Mississippi College, a small liberal arts institution, has an outstanding pre-medical program with approximately 300 undergraduate and 300 graduate students. The department is looking for a Ph.D. whose area of expertise is cell biology. The applicant must be able to teach Human Gross Anatomy or be willing to learn Human Gross Anatomy at our institution for the purpose of joining the faculty who teach Human Gross Anatomy. Human Gross Anatomy is a rigorous medical school-level course and involves human cadaver dissection. The position is for an assistant or associate professor depending on experience. The candidate must have a Ph.D. in a cell biology area. Involving undergraduates in research is expected. Applicants must be of Christian faith.

Founded in 1826, Mississippi College, Clinton, MS, is a private, comprehensive University with over 80 undergraduate majors, more than 50 graduate areas of study and approximately 5,000 students. It is affiliated with the Mississippi Baptist Convention.

Review of materials will commence immediately and will continue until the position is filled. Candidate should submit a CV and reference contact information to Dr. Beth Barlow, Chair of Biology, Box 4045 Mississippi College, Clinton, MS 39058, or sent in Pdf format to email: bbarlow@mc.edu



UNITED STATES AIR FORCE ACADEMY

Director of Aeronautics Research Center

The Department of Aeronautics anticipates hiring one full-time Aeronautics Research Center Director, beginning **01 May 2021**. We seek an energetic, experienced, passionate professional with a desire to inspire, educate and develop future Air & Space Force officers. Required qualifications: An earned doctoral degree in Aeronautical Engineering, Mechanical Engineering or a related discipline. Demonstrated experience running a large, multi-faceted research program.

Desired qualifications: Preference will be given to applicants whose education and experiences indicate the ability to lead a large stable of diverse research programs, as well as guide undergraduate projects in experimental methods and independent research.

The United States Air Force Academy (USAF), located just north of Colorado Springs, Colorado, is an undergraduate institution that awards a Bachelor of Science degree as part of its mission to educate, train, and inspire men and women to become officers of character, motivated to lead the United States Air Force and Space Force in service to our nation. Upon graduation, cadets are commissioned as 2nd Lieutenants in the Air Force or Space Force.

Requirements: The selected candidate will be subject to a security investigation leading to successful completion of a background investigation with a favorable adjudication. The selectee's failure to meet this requirement is grounds for termination.

To Apply: Go to www.usajobs.gov. Type in "USAF Academy" in the "Where" box and click on "Search Jobs." Then scroll down until you locate this position. For questions, contact the search committee chair, Dr. Jürgen Seidel, Jürgen.Seidel@afacademy.af.edu.



Term Faculty (Non-Tenure Track) Political Science (21-22)

The Department of Political Science at DePaul University invites applications for a full time, non-tenure-track position with primary expertise in the fields of American Politics and Public Law.

DePaul University is committed to recruiting diverse faculty to complement the diversity of its student body and Chicago area communities.

Responsibilities will include teaching courses on American Institutions (the Presidency and Congress) and areas of Constitutional law and the judicial process. For more information, e-mail polisci@depaul.edu or visit the department's web site at <https://las.depaul.edu/academics/political-science/Pages/default.aspx>

Apply: <https://apply.interfolio.com/84067>

DePaul University is an Equal Opportunity / Affirmative Action employer.



Term Faculty - Translation, Research & Instruction Faculty /Leadership, Language, and Curriculum (21-22)

This term faculty position entails bilingual-biliterate (Japanese/English) translation, research, and operations support in the Institute for Daisaku Ikeda Studies in education and teaching four courses in degree and credential programs in the Department of Leadership, Language, and Curriculum, including, inter alia, programs in Value-Creating Education for Global Citizenship, Bilingual-Bicultural Education, Curriculum Studies, etc.

DePaul University is committed to recruiting diverse faculty to complement the diversity of its student body and Chicago area communities.

Apply: <https://apply.interfolio.com/84669>

DePaul University is an Equal Opportunity / Affirmative Action employer.

JOB SEARCH TIPS

Admin 101: Being aware of how you, your words, and your actions will be perceived is not vanity — it's common sense.

The ability to read people is fundamental to good administration. And you can hone that skill. Stay in touch with faculty members. Be accessible when you can. The chairs, deans, and presidents with the highest approval ratings tend to be people who share the credit and convey a personal touch.

Get more career tips on jobs.chronicle.com



David D. Perlmutter is a professor in and dean of the College of Media & Communication at Texas Tech University. He writes the Career Confidential advice column for The Chronicle.

ACCOUNTING

Assistant/Associate Professor, Accounting

Bryant University
Assistant/Associate Professor, Accounting Bryant University seeks to fill a tenure-track Assistant/Associate Professor position in the Accounting Department. The successful candidate will have a strong commitment to excellence in teaching, to scholarly research, and to departmental and University service. While we welcome applications from candidates in all areas of accounting, the ideal candidate will have a background in IT Auditing/Auditing, Analytics, and Managerial. The successful candidate will be expected to be familiar with emerging technologies in accounting. Candidates must have a Ph.D. in Accounting from an AACSB-International or EQUIS accredited institution. ABD with completion expected by mid-July 2021 will be considered. For detailed information and to apply for this position, visit: <https://employment.bryant.edu/postings/2442>

COMPUTER SCIENCE

UIUC The Grainger College of Engineering: Professor (Open Rank) - Computer Science

University of Illinois at Urbana-Champaign
The Department of Computer Science at the University of Illinois Urbana-Champaign invites applications for full-time tenure-track faculty positions at all levels (Assistant Professor, Associate Professor, Full Professor). We particularly encourage applications in quantum computing, but also welcome applications from exceptional candidates in other areas. The University of Illinois is an Equal Opportunity, Affirmative Action employer that recruits and hires qualified candidates without regard to race, color, religion, sex, sexual orientation, gender identity, age, national origin, disability or veteran status. For more information, visit <http://go.illinois.edu/EEO>. Applicants are required to have (or expected to receive) a Ph.D. or equivalent degree in Computer Science or a related field. Additional qualifications include the ability to teach effectively at both the graduate and undergraduate levels and the potential to initiate and carry out independent research. We seek applicants that will contribute to the diverse, vibrant and inclusive atmosphere in the department as we strive to make computing's remarkable opportunities available to everyone through the continued expansion of our research and teaching activity in Urbana-Champaign, in Chicago, and online. Quantum computing faculty will engage with a growing campus and state-wide quantum research community through the new Illinois Quantum Information Science and Technology Center (IQUIST) and the Chicago Quantum Exchange. The Department of Computer Science is home to U.S. News & World Report top-5 undergraduate and graduate programs and is a key component of The Grainger College of Engineering at Illinois, one of the nation's elite engineering schools. Our history is, in part, the history of computing. From the ILLIAC to Blue Waters, MPI to OpenMP, Mosaic to YouTube, and the first vectorizing compilers to LLVM, Illinois CS faculty, students, and alumni have long been at the forefront of computing research and innovation. CS Department faculty have been founders of multiple startup companies including Reconstruct, Runtime Verification, Veriflow Systems, and others. Companies that have been founded or led by Illinois CS graduates include C3, Malwarebytes, Match.com, Microsoft, Netscape, Optimizely, PayPal, YouTube, and Yelp. Illinois Computer Science includes 78 tenure track faculty members,

29 teaching and research faculty, and 60 academic and research staff and professionals, and enrolls nearly 2000 undergraduates and 1900 graduate students, including over 420 PhD students. The Department faculty include 20 IEEE Fellows, 17 ACM Fellows, and 40 NSF Career Award winners. Our research embraces all major technical specializations in the profession, and is at the heart of the University of Illinois' rich network of interdisciplinary centers and institutes such as the National Center for Supercomputing Applications (NCSA), the Beckman Institute for Advanced Science and Technology, the Coordinated Science Laboratory, the Carl R. Woese Institute for Genomic Biology, and the Health Care Engineering Systems Center. We are pioneering innovations in computer science education, including new cross-disciplinary CS+X degrees for undergraduates and a growing online Master's Program, and our faculty are contributing the world's first engineering-based College of Medicine. More details about the department can be found at <http://cs.illinois.edu>. Qualified senior candidates may also be considered for tenured Associate Professor and Full Professor positions as part of the Grainger Engineering Breakthroughs Initiative in which new endowed professorships and chairs will be established in areas of strategic interest to The Grainger College of Engineering. Such areas include, but are not limited to, quantum, big data, machine learning, and robotics. More information about the Grainger Initiative can be found at <https://grainger.illinois.edu/research/grainger-breakthroughs>. Application review and interviewing will begin immediately. All applications received before March 15, 2021 will receive full consideration. Salary will be commensurate with qualifications. Preferred starting date is August 16, 2021 but is negotiable. Applications can be submitted by going to <http://jobs.illinois.edu> and uploading a cover letter, CV, research statement, teaching statement, and a statement on commitment to diversity, along with names and contact information of at least three references who will be contacted to provide letters. The statement on diversity should address past and/or potential contributions to diversity, equity, and inclusion through research, teaching, and/or service. Applicants who desire confidentiality should explicitly mention this in the first paragraph of their cover letter. For inquiry, please call 217-333-3426 or email HR@cs.illinois.edu. The University of Illinois conducts criminal background checks on all job candidates upon acceptance of a contingent offer. The University of Illinois System requires candidates selected for hire to disclose any documented finding of sexual misconduct or sexual harassment and to authorize inquiries to current and former employers regarding findings of sexual misconduct or sexual harassment. For more information, visit Policy on Consideration of Sexual Misconduct in Prior Employment." As a qualifying federal contractor, the University of Illinois System uses E-Verify to verify employment eligibility. The University of Illinois must also comply with applicable federal export control laws and regulations and, as such, reserves the right to employ restricted party screening procedures for applicants. We have an active and successful dual-career partner placement program and a strong commitment to work-life balance and family-friendly programs for faculty and staff (<https://provost.illinois.edu/faculty-affairs/work-life-balance/>).

COMPUTER SCIENCES

Assistant Professor of Computer Sciences

Western Washington University
Assistant Professor of Comput-

er Sciences Western Washington University 516 High Street Bellingham, WA 98225 Teach university courses, all levels, for Computer Science Dept and provide expert in Internet of Things and lightweight security. Maintain scholarly activ appro to CS and Dept. Participate in dept, uni, and prof serv activ. Req PhD in CS, CE or rel and one yr exp as Grad RA (CS), Grad TA (CS) or rel. Exp in prep and teach uni lab lec for CS. Published in Journal and conference in CS, spec in Internet of Things and lightweight security. Send resume to: Western Washington University, Attn: Ridley Williams, Computer Science Dept, 516 High Street, MS9165, Bellingham, WA 98225.

COUNSELING

Assistant Professor of Counseling

University of Montevallo
The Department of Health and Human Services at the University of Montevallo a public liberal arts university of 2500 students near Birmingham, Alabama, invites applications for a 9-month tenure-track position at the rank of Assistant Professor of Counseling beginning fall 2021. The preferred candidate will have an earned doctorate in Counselor Education from a CACREP accredited doctoral program, be licensed (or license eligible) as a professional counselor in the state of Alabama, have university level teaching experience, evidence of scholarly productivity and school counseling experience. Additionally, the candidate should have a professional identity as a Counselor Educator, affiliation with and membership in relevant professional counseling associations (e.g., ACA, ACES, ASCA), experience with CACREP accreditation, and commitment to integrating culturally competent, evidence-based pedagogic strategies and clinical practices. Responsibilities include teaching graduate level courses in counseling, advising, scholarship, service, and engagement in program and department activities such as committee work and recruitment. Review of applicants will begin immediately and continue until the position is filled. Additional information and application guidelines are available at <https://jobs.montevallo.edu>. UM is AA/EO Institution

DATA SCIENCE

Rowe Professor in Data Science

Bryant University
Rowe Professor in Data Science Bryant University Bryant University invites applications for an Endowed Professorship in Data Science who will take a leadership role in transforming our undergraduate Data Science program into one of national prominence as demonstrated through national rankings. Candidates should have a Ph.D degree with demonstrated expertise in Data Science and a dedication to academia. This is an ideal opportunity for a data scientist who is excited by the possibility of making a significant contribution to a program in its early stages of development. For detailed information and to apply for this position, visit <https://employment.bryant.edu/postings/2440>. To receive full consideration, interested persons must apply electronically.

HISTORY

Assistant Professor of History

Barnard College
Barnard College (New York, NY) seeks Assistant Professor of History. Teach history and related disciplines at an undergraduate, liberal arts level. Teaching responsibilities include courses such as Introduction to History of Science since 1800, Emerging Cities: 19th Century Urban History of the Americas and Europe,

and Women, Gender and Sexuality in the 20th Century U.S., among others. Engage in standard nonteaching duties, such as attending department and faculty meetings, serving on department and college committees and mentoring undergraduate students. Req: Ph.D. in History or a related field. Requires a record of original and exceptional research in history and/or related fields, as evidenced by peer-reviewed publications, presentations at national/international conferences, and similar academic activity. Inquiries to Lisa Tiersten at ltiersten@barnard.edu

MATHEMATICS

Instructor

Hawai'i Community College
Instructor. Will teach courses in mathematics; advise students; and perform service. Requirements: MA in mathematics. Interested persons should mail CV to Hawaii Community College, 1175 Manono Street, Hilo, HI 96720. UH is an EEO/AA employer.

MULTIPLE DISCIPLINES

Dornsife College of Letters, Arts and Sciences Faculty Positions in Multiple Disciplines

University of Southern California
The University of Southern California's Dana and David Dornsife College of Letters, Arts and Sciences in Los Angeles, California, announces searches for research, teaching, and practice-track faculty positions at the rank of Lecturer, Senior Lecturer, Master Lecturer, Assistant Professor (Teaching), Associate Professor (Teaching), Professor (Teaching), Assistant Professor of the Practice, Associate Professor of the Practice, Professor of the Practice, Assistant Professor (Research), Associate Professor (Research), Professor (Research), Visiting Assistant Professor, Visiting Associate Professor, and Visiting Professor, Writer in Residence, and tenured and tenure-track faculty positions at the rank of Assistant Professor, Associate Professor, and Professor, in the departments and programs of American Studies and Ethnicity, Anthropology, Art History, Biological Sciences, Chemistry, Classics, Comparative Literature, Earth Sciences, East Asian Languages and Cultures, Economics, English, Environmental Studies, French and Italian, Gender and Sexuality Studies, General Education, History, Latin American and Iberian Cultures, Linguistics, Mathematics, Middle East Studies, Philosophy, Physical Education, Physics and Astronomy, Political Science and International Relations, Psychology, Quantitative and Computational Biology, Religion, Slavic Languages and Literatures, Sociology, Spatial Sciences, Thematic Option, and the Writing Program. Applicants should minimally have a Ph.D. (or Masters Degree for positions in writing, language teaching, or physical education, or equivalent experience for Practice positions) in appropriate field of study, research expertise and/or teaching abilities commensurate with rank and title, as appropriate. For more information regarding open faculty positions, please go to <https://uscjobs.usc.edu/> to submit the requested materials. We are accepting applications, from qualified applicants only, until positions are filled.

PHYSIOLOGY

Associate Professor

Mabarrishi University of Management
Associate Professor - - teach undergraduate and graduate courses in physiology including the following: Advanced Topics in Physiology; Human Physiology and Pathophysiology 1 & 2; Anatomy and Physiology; as well as other courses assigned by the department chair. Must have a Master's degree in Physiology or

a related degree, and be willing to work in an active department. Contact Rachel Lansky, Office of the Dean of Faculty, Maharishi International University, 1000 North Fourth Street, Fairfield, IA 52557. 641 472-1161.

POLISH LANGUAGES

Preceptor in Polish Languages
Harvard University, Faculty of Arts & Sciences
The Department of Slavic Languages & Literatures at Harvard University seeks applications for a position as Preceptor in Polish Language. The appointment is expected to begin on July 1, 2021 with teaching beginning in Fall Semester 2021. The preceptor will be responsible for courses in beginning and intermediate Polish (4 courses per academic year) and additional language tutorials in advanced Polish as needed. The preceptor will work with the Director of the Slavic Language Program to develop courses and materials in Polish language and assist with recruitment of students and expanding interest in the Polish language program. An interest in furthering broader Slavic Language Program goals is highly desirable, including research in second-language acquisition and materials development for Polish. There may also be opportunities to develop and lead a Harvard summer study abroad program in Poland. Preceptorships at Harvard are initially for one year, with multi-year contracts possible in subsequent years for up to eight total years, contingent upon performance, enrollments, curricular need, and divisional dean approval. Interviews will be conducted by phone or video conference in spring 2021.

PORTUGUESE

Senior Preceptor in Portuguese
Harvard University
The Department of Romance Languages & Literatures seeks applications for a senior preceptor in Portuguese. The appointment is expected to begin on July 1, 2021. The senior preceptor will be responsible for teaching three courses per year at the intermediate and advanced levels. Administrative duties include training and supervising teaching fellows, curriculum development (at all levels), and undergraduate advising and recruitment. The position is for five years and renewable contingent upon performance, enrollments, and curricular need. The successful applicant should be well versed in the issues of teaching Portuguese as a foreign language. Preference will be given to candidates who have experience teaching all levels of Portuguese, coordinating language programs, training and supervising teaching fellows, and advising students. The applicant should develop strong relationships with departments, communities, and organizations both within and outside the university and build, grow, and strengthen the Portuguese language program. Specialization in language pedagogy and second language acquisition is highly desirable. Applicants should have native or near-native proficiency in Portuguese. A strong doctoral record is preferred as well as working knowledge of instructional technology. Please submit the following documents through the ARIeS portal (<https://academicpositions.harvard.edu>). Applications must be submitted no later than March 1st 1. Cover letter 2. Curriculum Vitae 3. Teaching statement (describing teaching approach and philosophy) 4. Teaching materials (e.g., teaching chart listing courses taught in reverse chronological order; representative syllabi; teaching evaluations) 5. Statement describing efforts to encourage diversity, inclusion, and belonging, including past, current, and anticipated future contributions in these areas. 6. Names and con-

tact information of at least three referees, who will be asked by a system-generated email to upload a letter of recommendation once the candidate's application has been submitted. Three letters of recommendation are required, and the application is considered complete only when at least three letters have been received. Harvard University is an equal opportunity employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability status, protected veteran status, gender identity, sexual orientation, pregnancy and pregnancy-related conditions, or any other characteristic protected by law.

RURAL SOCIOLOGY AND RURAL PUBLIC POLICY

Assistant Professor of Rural Sociology and Rural Public Policy
Iowa State University
The Department of Sociology in the College of Agriculture and Life Sciences at Iowa State University (ISU) in Ames, Iowa seeks candidates for tenure-track faculty position at the rank of Assistant Professor in areas of rural sociology and rural public policy. The successful candidate will make major contributions to existing teaching and research programs. View complete details and application instructions for posting R4311 at https://isu.wd1.myworkdayjobs.com/en-US/IowaStateJobs/job/Ames-IA/Assistant-Professor-in-Rural-Sociology-and-Rural-Public-Policy_R4311 Qualifications: PhD in rural sociology, sociology, public policy, or closely related field by start date Proposed start date: August 16, 2021 Salary: Commensurate with qualifications Direct questions to Rachel Burlingame, Administrative Assistant (rmb@iastate.edu). Iowa State University is an Equal Opportunity/Affirmative Action employer. All qualified applicants will receive consideration for employment without regard to race, color, religion, sex, national origin, disability, or protected Veteran status and will not be discriminated against.

SOCIOLOGY

Assistant Professor of Sociology
Western New England University
Assistant Professor of Sociology Western Washington University 516 High Street Bellingham, WA 98225 Responsible for teach university-level courses, both graduate and undergraduate in Sociology. Develop new courses within social demography. Engage in departmental and university service. Contribute to general sociology courses. Requires a Ph.D. in Sociology, or a closely rel field and 2 yrs exp as Instructor, Grad TA, Grad Teaching Fellow, or rel. Exp must include teaching sociology courses in areas of gender, population studies, demographic methods, at the uni level, publication in peer reviewed journals in the area of Sociology, including gender and demography. Send resume to: Western Washington University, Attn: Maggie Huang, Sociology Dept, 516 High Street, Bellingham, WA 98225-9081.

SOUTH ASIAN HISTORY

Assistant Professor - South Asian History
Western Washington University
Assistant Professor South Asian History Western Washington University 516 High Street Bellingham, WA 98225 Teach lower-division and upper-division courses in South Asian history, including South Asian History survey courses. Teach up div courses on S Asia with candidate's specialty. Res and pub scholar articles in S Asian His. Req PhD in History, S Asian

History, or rel and 2 yrs of exp as A Prof, Visit A Prof, incld teach courses in S Asian History, History, and rel. Res and strong pub record. Send resume to: Western Washington University, Attn: Dr. Johann Neem; History Department, 516 High Street, Bellingham, WA 98225-9061.

SPECIAL EDUCATION

Assistant Professor or Lecturer of Special Education
Glenville State College
Glenville State College is seeking applicants for a full-time, tenure-track or lecturer position in Special Education beginning August 2021. Faculty responsibilities include teaching, advising students, participating in departmental and college service activities, involvement in recruitment and retention activities, and ongoing professional development. Individuals with interest or expertise in curriculum innovation as well as commitment to teaching and scholarly excellence in their specialties are encouraged to apply. Expertise in instructional technology is desirable. Duties: The successful candidate will teach courses such as Foundations of Education, Introduction to Educating Exceptional and Culturally Diverse Students, Introduction to Intellectual and other Developmental Disabilities, Introduction to Specific Learning Disabilities, Introduction to Emotional and Behavioral Disorders , Educational Assessment of Students with Exceptionalities. The candidate will be expected to evaluate, revise and recommend updates for all special education classes in alignment with CEC and CAEP standards. The candidate will develop or enrich community relationships. The candidate would also be expected to be part of the CAEP accreditation team for the Teacher Education Department and education programs. Qualifications: Applicants with an earned doctorate degree are preferred, but candidates with ABD will be considered. The successful applicant will have or be eligible for teaching certification in Special Education. Three to five years of public school teaching is preferred. Candidates should have experience in Co-teaching/co-development of curriculum with public school partners. Candidates should have experience in the delivery and development of on-line learning, QM experience preferred. Experience working with, writing to CAEP standards required. Glenville State College is an Equal Opportunity/Affirmative Action Employer.

SPORTS ADMINISTRATION/PHYSICAL EDUCATION

Assistant Professor of Sports Administration/PE
Eastern New Mexico University-Portales
Assistant Professor of Sports Administration/PE for Eastern New Mexico University to work at our Portales, NM loc. Full-time, tenure-track position in College of Education & Tech. Teach undergraduate & graduate courses in sports management / administration & health & PE. Teach on campus & online. Academic advising of students. Engage in scholarly & service activities. Work collaboratively & effectively with wide range of constituencies in diverse community. May involve some weekend hrs at recruiting events. May undergo background checks incl ref checks. Must have PhD (ABD) in PE, Sport Admin, Sport Management or related field. Apply at <https://www.enmu.edu/about/employment-and-hr/employment-opportunities>. Include the following docs along with online application: letter of interest, resume, contact info for three references, transcripts (unofficial for application purposes). EEO/AA/Title IX Employer

STUDENT SUPPORT

Director for Student Support Services
Washington State University
Washington State University Pullman announces a full-time, twelve-month federally-funded grant position as TRIO Director for Student Support Services (SSS), which provides comprehensive support to eligible students who are from first-generation or low-income families and/or have a documented disability. The Director supervises staff, liaisons to other campus services, and coordinates the activities that facilitate the retention and academic success of students; including academic advising, academic monitoring, financial aid/economic literacy, skills and career development, and tutoring. The Director provides overall leadership, budget management, evaluation, and meeting administrative requirements. Position is subject to criminal background check. For detailed position description, minimum and preferred qualifications and to apply please see <https://apptrkr.com/2165974>. WSU is an EEO/AA/ADA employer and educator.

THAI

Lecturer
University of Michigan-Ann Arbor
University of Michigan - Ann Arbor Lecturer Teach Thai language and culture at the graduate and undergraduate levels and develop and manage course materials. Requirements: M.A. or foreign equivalent in Thai language, linguistics, or language pedagogy. Submit letter of application, CV, and three letters of reference to Nikki Gastineau at alc-admin@umich.edu. The University of Michigan is an Affirmative Action/Equal Opportunity Employer.

VEDIC SCIENCE

Instructor of Vedic Science
Maharishi University of Management
Instructor - Teach undergraduate courses in the Vedic Science Department such as Physiology and Consciousness; Physiology, Consciousness and the Veda; and manage the EEG lab and teach EEG, Brain and Enlightenment. Must have a Masters degree in Vedic Science, Sociology or related field; and be able to work in active department and participate in campus and community activities. Contact Rachel Lansky, Office of the Dean of Faculty, Maharishi International University, 1000 North Fourth Street, Fairfield, IA 52557. 641 472-1161.



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New Chief Executives



M. Katherine Banks, vice chancellor for engineering and national laboratories and dean of Texas A&M University at College Station's College of Engineering, has been named the sole finalist for president. If approved at a future meeting of the A&M system's Board of Regents, she would succeed Michael K. Young, who stepped down at the end of December. John Junkins has served as interim president since then.



Laurie A. Carter, president of Shippensburg University, will become president of Lawrence University on July 1. She will succeed Mark Burstein and will be the first Black president to lead the university.



Daniel J. Myers, a professor of sociology and former provost at American University, will become president of Misericordia University on July 1. He will succeed Kathleen Owens.

Chief executives (continued)

APPOINTMENTS

Paul Alivisatos, executive vice chancellor and provost at the University of California at Berkeley, will become president of the University of Chicago on September 1. He will succeed Robert J. Zimmer.

David D. Allen, dean of the School of Pharmacy and executive director and research professor in the Research Institute of Pharmaceutical Sciences at the University of Mississippi, has been named president of the University of Health Sciences and Pharmacy in St. Louis. He will succeed John A. Pieper, who plans to retire.

Kevin F. Hallock, dean of the Cornell SC Johnson College of Business at Cornell University, has been named president of the University of Richmond. He will succeed Ronald A. Crutcher, who plans to step down.

Jim Hood, a professor of English at Guilford College, has been named interim president. He replaces Carol Moore, who became interim president in August after Jane Fernandes stepped down.

Amy Marcus-Newhall, vice president for academic affairs and dean of faculty at Scripps College, has been named interim president. She previ-

ously served as interim president of the college in 2015.

Steven D. Mason, provost and vice president for academic affairs at LeTourneau University, has been named president of the university.

Christine Johnson McPhail, president and chief executive of the McPhail Group LLC and a professor of practice in the John E. Roueche Center for Community College Leadership at Kansas State University, has been named president of Saint Augustine's University, in North Carolina. Her husband, Irving Pressley McPhail, served as president of the university until his death in October.

Mike Muñoz, vice president of student services at Long Beach City College, has been named interim superintendent-president.

Richard Plumb, executive vice president and provost at the University of St. Thomas, in Minnesota, will become president of Saint Mary's College of California on July 1. He will succeed James Donahue.

Gregory Postel, interim president of the University of Toledo since July, has been named to the post permanently.

Ken Shaw, president of Southwestern Adventist University, in Texas, will become president of Southern Adven-

tist University, in Tennessee, on June 1. He will succeed David Smith, who plans to retire.

RESIGNATIONS

Sam Horn, president of the Master's University and Seminary, has stepped down after one year in the role.

Morton Schapiro, president of Northwestern University since 2009, plans to step down on August 31, 2022.

RETIREMENTS

Kathleen M. Murray, president of Whitman College since 2015, plans to retire at the end of the 2021-22 academic year.

Chief academic officers

APPOINTMENTS

Michael Dunphy, interim vice president for academic affairs since June 2020 at Walsh University, in Ohio, has been named to the post permanently.



Meghan Griffin, associate provost and dean of unrestricted education at Southeastern University, has been named provost.

Lynda A. Szymanski, associate provost at St. Catherine University, has been named provost at Luther College.

Tynisha Willingham, dean of the College of Education at Mary Baldwin University, has been named interim provost and chief academic officer.

Other top administrators

APPOINTMENTS

Randi Arsenault, senior associate dean and director of admissions at Colby College, will become assistant vice president for admissions and financial aid and dean of admissions on July 1.

Sunil B. Gupta, dean of the Center of Adult Continuing Education and Workforce Development at the City University of New York Borough of Manhattan Community College, has been named vice president for adult and continuing education at the City University of New York La Guardia Community College.

Claudia Marroquin, director of admissions at Bowdoin College, will become senior vice president and dean of admissions and financial aid in July.

Dan Peterson, director of college compliance at Western Governors University, has been named president of the online division at Herzing University.

Robert Robinson, director of multicultural student affairs at the University of North Georgia, has been named the

inaugural vice president for diversity, equity, and inclusion at Northampton Community College.

Deborah Shufren, deputy chief investment officer of Brandeis University, will become chief investment officer at Colby College on April 1.

J. Goosby Smith, an associate professor of leadership and management and assistant provost for diversity, equity, and inclusion at the Citadel, will become vice president for community belonging and chief diversity officer at Pepperdine University.



STEVEN F. SOBA

Steven F. Soba, vice president for enrollment and marketing at Muskingum University, has been named vice president for enrollment management at Husson University.

Aimee Uen, vice president for finance and controller at Loyola Marymount University, has been named senior vice president and chief financial officer.

RETIREMENTS

Sheri Phillips, vice president for student development at Evangel University, plans to retire.

Deans

APPOINTMENTS

Colin Crawford, dean of the Louis D. Brandeis School of Law at the University of Louisville, has been named dean of the School of Law at Golden Gate University.

John Daly, interim dean of the Lewis Katz School of Medicine at Temple University since October 2019, has been named to the post permanently.

Katie Evans, director of the mathematics and statistics and online programs and associate dean of strategic initiatives in the College of Engineering and Science at Louisiana Tech University, will become dean of the College of Science and Engineering and a professor of mathematics at Houston Baptist University on July 1.

Cristina Goletti, chair and an associate professor in the theater and dance department at the University of Texas at El Paso, has been named dean of the College of Performing and Visual Arts at the University of Northern Colorado.



YING SHANG

Ying Shang, dean of the College of Engineering and Computer Science at the University of Evansville, has been named dean of the College of Engineering and School of Computer Sciences at the Indiana Institute of Technology.

RESIGNATIONS

David Johnsen, dean of the College of Dentistry and Dental Clinics at the University of Iowa, will step down after this semester. Johnsen drew criticism from Republican lawmakers af-

ter he sent a mass email objecting to the 2020 executive order that banned diversity training that former President Donald Trump deemed "offensive and anti-American."

John Keller, associate provost for graduate and professional education and dean of the Graduate College at the University of Iowa, plans to step down on July 31.

Other administrators

APPOINTMENTS

Richard Bakken, a lecturer in psychology and leadership studies at Pennsylvania State University, has been named assistant chief information officer of support services in the residential and dining enterprises IT division at Stanford University.

David Freeman Engstrom and **Nora Freeman Engstrom**, professors of law at Stanford University, have been named co-directors of the Stanford Center on the Legal Profession. They will succeed Deborah Rhode, the founder and former director of the center, who died in January.

Emily Esten, Judaica Digital Humanities Project Coordinator at the University of Pennsylvania Libraries, has been named the inaugural Arnold and Deanne Kaplan Collection of Early American Judaica curator of digital humanities.

Anand Jagota, a professor in the departments of bioengineering and chemical and biomolecular engineering at Lehigh University, has been named associate dean of research for the College of Health.

Justin Nowicki, assistant vice president for development at Mount Vernon Nazarene University, has been named associate vice president for enrollment management.

Tweed Roosevelt, a professor and chairman of the Theodore Roosevelt Institute at Long Island University and a great-grandson of Theodore Roosevelt, has been named chairman of the university's new Roosevelt School.

Christian Sundquist, a professor at Albany Law School, has been named associate dean for research and scholarship.

Submit items to
people@chronicle.com

Organizations

APPOINTMENTS

Marjorie Hass, president of Rhodes College, has been named president of the Council of Independent Colleges. She will succeed Richard Ekman, who plans to step down in the summer.

Sharon Higgins, associate vice president for marketing and communications at Loyola University Maryland, has been named associate vice president for marketing services at Eduvantis, a strategic consulting firm.

RESIGNATIONS

William D. Hansen, president and chief executive of Strada Education Network, plans to step down. Tom Dawson, Strada's chief operating officer, has been named interim chief executive.

Deaths

John Bentson, former chief of the neuroradiology department at the University of California at Los Angeles Medical Center, died of complications

of Covid-19 on December 28. He was 83.

Dennis R. DePerro, president of St. Bonaventure University since 2017, died due to complications from Covid-19 on February 28. He was 62.

Joseph D. Duffey, a former president of American University and the University of Massachusetts at Amherst, died on February 25. He was 88. Duffey also served as chair of the National Endowment for the Humanities under Jimmy Carter and later as director of the U.S. Information Agency.

Norman Golb, a professor emeritus of Jewish history and civilization at the University of Chicago, died on December 29. He was 92. Golb refuted the original theory behind the origin of the Dead Sea Scrolls.

Leo A. Goodman, a former assistant professor of sociology and statistics at the University of Chicago, died of complications of Covid-19 on December 22. He was 92.

David Katzenstein, a professor emeritus of infectious diseases and global health at Stanford Medicine, died of Covid-19 on January 25. He was 69.

Naomi Levine, founder of the George H. Heyman Jr. Center for Philanthropy and Fundraising at New York University, died on January 14. She was 97. Levine was hired as the university's chief fund raiser in 1978. She later taught law at the university before her retirement in 2004.

J. Hillis Miller, a professor emeritus in the departments of comparative literature and English at the University of California at Irvine, died on February 7. He was 92.

Jon Westling, a former president of Boston University, died on January 15. He was 78.

- COMPILED BY JULIA PIPER

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CHALLENGING STIGMA



As the stress of the COVID-19 pandemic has increased emphasis on the importance of prioritizing mental health, The University of Toledo's faculty experts are advancing our understanding of the body's response to trauma and the coping mechanisms that work best.



New research by **Xin Wang, Ph.D.**, professor of psychiatry and neuroscience, confirms significant physical changes in the brains of patients with post-traumatic stress disorder, which could open new doors for treatment options.



Spending time with your pet is more important during social isolation in a pandemic, according to **Janet Hoy-Gerlach, Ph.D.**, associate professor of social work, who studies the physical, emotional, psychological and social benefits of the human-animal bond.



Everyday stress is the strongest predictor of COVID-related healthy anxiety, **Jon Elhai, Ph.D.**, professor of psychology, found in a study, which fuels fear of missing out and the unhealthy coping mechanism of excessive smartphone use.



Cheryl McCullumsmith, M.D., Ph.D., professor and chair of the Department of Psychiatry, is conducting a clinical trial to evaluate whether Prozac can prevent the extreme immune response experienced by COVID-19 patients called cytokine storms.

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