

STEM TEACHING AND LEARNING



INSIDE
HIGHER ED

Supported By:

DigitalEd

Introduction

STEM teaching and learning is both a great challenge in higher education. STEM teaching and learning is also the subject of innovation. Only a minority of students are ready for STEM at the college level. Colleges are working hard to attract more students into these disciplines, and to reach students who may be interested but lack the necessary preparation.

The articles in this collaboration explore the issues involved, and look at the efforts of some colleges to attract more students to STEM.

Inside Higher Ed welcomes your feedback on this compilation and your ideas for future coverage.

--The Editors

editor@insidehighered.com

DigitalEd

The last few months have been remarkable - the global academic community saw a wave of institutions closing campuses and transitioning to remote teaching in order to control the spread of COVID-19.

As a provider of online higher education learning solutions for STEM-focused disciplines, we at DigitalEd work closely with educators as they adapt their curricula for delivery online. From the onset of this crisis where instructors were mandated to move to remote course delivery on short notice, we worked closely with the education community to understand the additional challenges encountered in this environment, and the steps instructors took to overcome them. Unsurprisingly, the community rose to the challenge. They focused on ensuring that their students could complete their semesters, and in the process, we learned how determined these instructors were to preserve the quality of education, such that students could remain on track to complete their course requirements and degrees.

Institutions pivoted quickly to remote teaching as a response to the pandemic to ensure the safety of their students, faculty, and staff. While the full impact of such a rapid change will take time to fully understand, this pivot has afforded us the opportunity to share experiences, evaluate, and quickly iterate on technologies that aim to support and enhance the online learning experience. As an education technology company deeply engaged in STEM, we are delighted to support that journey and sponsor this series from Inside Higher Education.

This series of articles has been carefully curated to offer a variety of perspectives on topics related to the delivery of online education. I hope you find these resources insightful and personally useful, as you continue to refine and evolve your teaching in the months to come.



Sincerely,

Christina Perdikoulis

President

DigitalEd

Momentum in Physics Ed

A new approach to teaching physics "energy first" holds promise, especially for students who struggle with math.

By **Colleen Flaherty** // December 3, 2019

Math, specifically calculus, is a barrier to many natural sciences, technology and engineering fields. Physics, which is math-heavy, often proves similarly challenging to students who wish to pursue STEM degrees.

A new way of teaching introductory, calculus-based physics holds some promise for students who struggle with math, however. The curriculum involves two major changes from the way this standard course is typically taught. Whereas most courses begin with instruction on forces and vector mathematics, this begins instead with energy -- which, proponents say, better plays to students' intuition. The course also asks students to do more calculus themselves, to make sure they understand it.

The two adjustments are related and "reinforce one another," said Christopher Fischer, engineering physics director and associate chair of physics and astronomy at the [University of Kansas](#), as beginning the course with energy rather than forces "automatically requires more calculus."

Fischer co-wrote a [recent study](#) that demonstrated that this calculus-enhanced "energy-first" curriculum resulted in higher gains on the Force Concept Inventory exam, a basic physics assessment, for all students. It also improved later performance in engineering courses for students who entered college with lower ACT math scores.

In other words, the study says, "the downstream benefits were largest for students with lower math abilities who also pose a larger retention risk." The new curriculum, therefore, "has the potential to improve student retention by specifically helping the students who need help the most, including traditionally underserved populations who often have weaker mathematics preparation."

Fischer said he and his co-authors believe that organizing the course in this way "may be helping students to overcome the well-documented math transference barrier to learning physics." It's well-known that forces and associated vector mathematics "pose a significant learning curve for students," he added, and delaying them allows students to focus "more on learning the physics."

A 'Positive Feedback Loop'

That creates "a positive feedback loop" in which students improve their physics and math skills at the same time, Fischer said. He and colleagues also believe the approach is exportable to any institution of any size. Fischer wrote a [textbook series](#) that introduces classical mechanics using the concept of energy conservation first, before forces. And he and his colleagues have made lecture slides, in-class exercises and homework assignments that do the same -- all of which they're willing to share upon request.



Christopher Fischer

Fischer's co-authors, all from physics at Kansas, are Sarah LeGresley, assistant teaching professor; Jennifer Delgado, associate teaching professor; Christopher Bruner, Ph.D. candidate; and Michael Murray, professor. *Physical Review Physics Education Research* published the study.

Neither the new course or the traditional course are lecture-based, as both use active learning. Before coming to class, for example, students read a textbook section or watch a video on a given topic. About 20 minutes of the class is devoted to a professor's presentation, and students work together to solve multiple problems during the rest of the class session. Students then do graded homework assignments.

The new curriculum, however, which began in 2015, develops classical mechanics using the

What Do We Know About This Spring's Remote Learning?

concepts of energy and energy conservation before introducing the concept of force. "Our intention in structuring the curriculum in this way was to provide students a common conceptual and mathematical scaffold for solving a wide variety of problems," the paper says. We "hoped to help students understand the concepts that underpin the mathematical strategies and associated equations rather than the strategies themselves."

An Energy-First Approach

An energy-first approach is probably best described as Hamiltonian mechanics, the authors say. In terms of math, it relies more heavily on both differential and integral calculus than the traditional force-first curriculum.

For example, in the enhanced PHSX 211 course, as opposed to 210, students use calculus routinely when covering one-dimensional and two-dimensional translational motion, circular motion, rotational motion, and oscillatory motion.

"We hoped that this repeated use of calculus through the curriculum would help students improve their fluency with applying calculus to solving physics problems," the study says. The authors further "believe this curriculum empowers students to derive their own equations for describing systems and solving problems, rather than relying solely on equations derived by others."

“

We hoped
that this repeated use of calculus
through the curriculum would help students
improve their fluency with applying calculus
to solving physics problems.

”

While the paper has generated buzz, it has some critics. Among them is Suzanne White Brahmia, an assistant professor of physics at the University of Washington, who has written about the need for "mathematizing," or translating between the concrete and abstract, to be a bigger part of the physics curriculum. She had several concerns, including that the new intervention was carried out in a course with so many fewer students than the control.

"I would be very cautious about promoting it as breakthrough evidence," Brahmia said, calling the study "interesting but not at all convincing."

It's "entirely possible that well-taught, smaller courses with more contact hours could achieve the same results," she added. "There is

lots of evidence for that."

True: the curriculum group had fewer than half the students in the comparative traditional curriculum class. The paper acknowledges this -- and the fact that its scope, of just one, unnamed Midwestern university, was limited. But Fischer said he and his colleague tried to control variation in class size by having the same ratio of faculty members and undergraduate teaching assistants to students in each class.

The revised course also involves 25 extra minutes of class time twice a week. So, the paper says, it's "possible that this extra time results in improvements in student learning." The authors plan to assess the impact of differences in class size and contact hours in a future study. ■

Read Original Article ▶▶

<https://www.insidehighered.com/news/2019/12/03/new-approach-teaching-introductory-physics-first-holds-some-promise>

möbius



MÖBIUS PLATFORM

The online learning platform
built for STEM courses



OPEN CONTENT

Ready to use, editable
high-quality content

Möbius Content blends the convenience of publisher-quality course content, with the flexibility to customize and enhance your courses, ultimately improving student outcomes.

Access more than 20 math-focused STEM content packs out of the box with the Möbius platform.

See our full Starter Content Bundle list at www.digitaled.com/content
or try out some of our bundled content in our online demo tool at
www.digitaled.com/demo.



info@digitaled.com



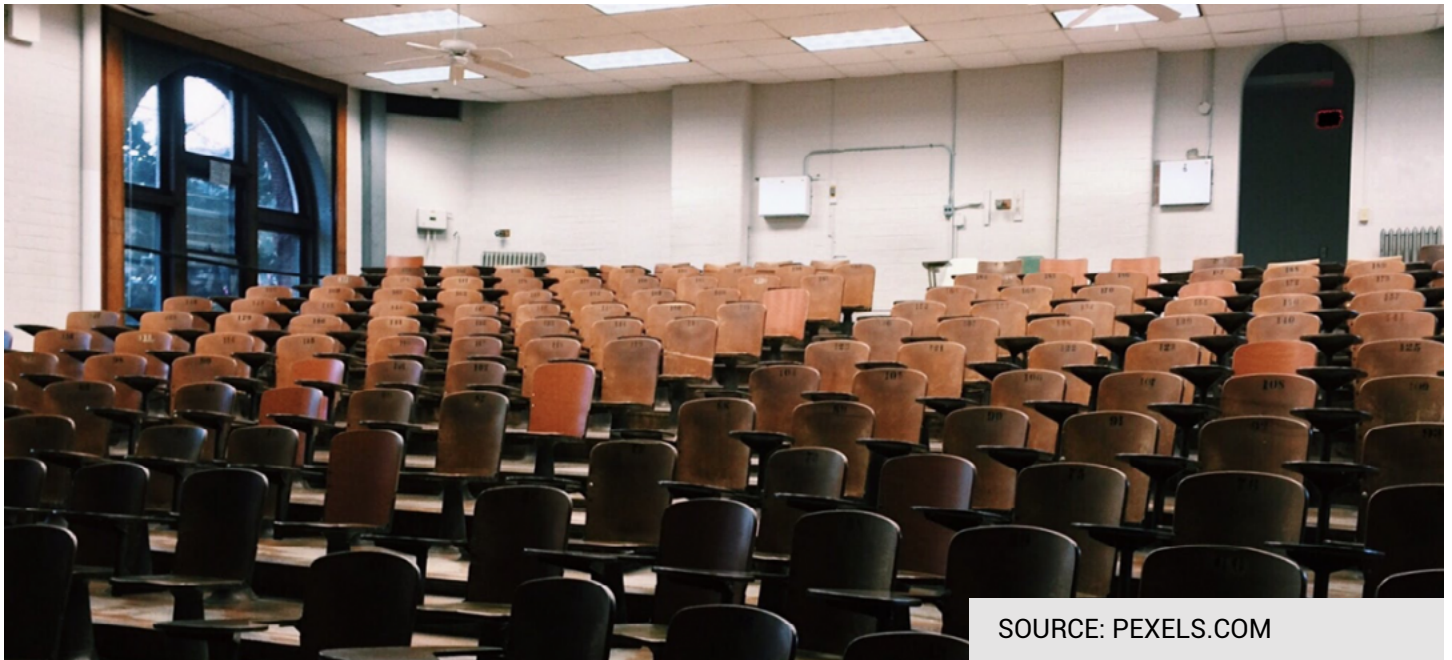
www.digitaled.com

DigitalEd

Much Ado About Class Size

New study argues that the class-size debate needs a lot more nuance. Will this finally move conversations forward, beyond “small is good” and “big is bad”?

By **Colleen Flaherty** // June 18, 2020



SOURCE: PEXELS.COM

There is now a body of literature questioning the link between small class size and student success. A new study of interactions between different class sizes and more than a dozen other variables within Temple University's general education program further supports the “small ain't all” argument. It encourages educational researchers to look deeper at the effect of class size on student success, and to the effect of peers as well as teaching methods, especially in an era of constrained resources.

The study also has some hidden implications for COVID-19-era instruction, since professors teaching remotely or in hybrid models arguably have more flexibility with respect to class size.

“In terms of student race and

gender, the findings for underrepresented groups contrast with previous research, which has found that smaller class sizes correlate with improved academic outcomes,” states [the new study](#), published in *Educational Researcher*. That's probably because “the effect of class size is far more nuanced than historically discussed.”

When considering small class size outcomes, compared to other class sizes, African American, Hispanic and American Indian men actually performed worse in social science courses relative to their peers, whereas white and Asian and Pacific Islander women performed best.

Medium-size classes had a more varied pattern, according to the study, yet underrepresented men

and women experienced no change in outcome across disciplines.

One possible explanation? Social group theory. The influence of peers, not just professors, is a factor, according to the paper.

“Instructors generally favor smaller class sizes because it allows them to work closely and develop a relationship with their students,” the study says. “However, this reasoning does not consider learning that may happen either between students or even outside of the classroom.”

As for science, technology, engineering and math general education courses, underrepresented minorities and women of all backgrounds appear to be unfazed “by increased class sizes,” except for white and Asian and Pacific Island-

Much Ado About Class Size (cont.)

Table 5
Full Table of Interaction Effects of Model Variables on Transformed GenEd Course Grade (n = 172,516)

	Male						Female					
	Overrepresented Groups			Underrepresented Groups			Overrepresented Groups			Underrepresented Groups		
	Social Science GenEds	STEM GenEds	Arts & Humanities GenEds	Social Science GenEds	STEM GenEds	Arts & Humanities GenEds	Social Science GenEds	STEM GenEds	Arts & Humanities GenEds	Social Science GenEds	STEM GenEds	Arts & Humanities GenEds
Small class sizes (up to 25th percentile: ≤20 students)	Reference Group	.114 (.032)***	.003 (.019)	-.148 (.037)***	-.179 (.065)**	-.025 (.038)	.184 (.021)***	-.072 (.037)	.022 (.021)	-.077 (.047)	.056 (.082)	.039 (.048)
n	2,796	961	11,252	515	195	2,053	2,885	1,098	11,303	948	351	3,490
Medium size classes (26th-50th percentile: 26-30 students)	-.020 (.024)	-.025 (.042)	.062 (.027)*	.009 (.046)	.079 (.081)	-.042 (.052)	.062 (.026)*	-.070 (.046)	-.083 (.029)**	.006 (.058)	.001 (.103)	.042 (.065)
n	3,086	1,987	10,725	628	359	1,858	3,516	2,088	10,692	1,205	595	3,249
Large size classes (51st-70th percentile: 31-40 students)	-.025 (.020)	-.048 (.040)	.051 (.039)	.034 (.039)	.039 (.077)	-.123 (.071)	.015 (.022)	-.046 (.043)	.004 (.040)	.003 (.049)	.076 (.098)	.118 (.090)
n	9,376	2,224	1,025	1,804	388	173	9,660	2,304	954	3,160	688	325
Extra large size classes (71st-80th percentile: 41-60 students)	.009 (.023)	-.174 (.047)***	-.077 (.042)	.013 (.043)	.007 (.087)	-.017 (.070)	-.015 (.024)	.029 (.048)	.096 (.039)*	.073 (.054)	-.043 (.109)	-.100 (.087)
n	4,998	1,224	1,122	908	203	204	4,739	1,484	1,231	1,529	400	423
Oversized classes (>80th percentile: >60 students)	-.079 (.025)**	-.033 (.048)	-.004 (.040)	-.053 (.041)	.091 (.077)	-.036 (.054)	.011 (.023)	-.140 (.043)**	-.011 (.030)	.122 (.051)*	-.082 (.098)	-.070 (.070)
n	7,189	3,015	3,207	1,234	446	511	6,700	2,459	2,544	2,057	705	726

Note. Other racial/ethnic groups have been omitted for simplicity.
*p < .05. **p < .01. ***p < .001.

SOURCE: ETHAN AKE-LITTLE

er women in especially large, "over-size" classes, the study says.

Only white and Asian and Pacific Islander men in small STEM classes appear to experience a potential increase in student achievement.

While STEM professors have historically attributed white and Asian male "dominance in these fields to better academic preparation compared to their underrepresented counterparts," the paper says, the lack of a support system for other groups may help explain why student achievement for African American, Hispanic and American Indian students is "mostly static, regardless of class size."

Perhaps most importantly, no student group in any of the fields studied appeared to be affected, good or bad, by large class sizes.

"One possible reason for this is course curricular design and instructional delivery," the authors

suggest. That is, as class size increases, instructors tend to "modify the breadth and depth of course objectives, course assignments, and course-related learning outside the classroom."

A class size between 31 and 40 may well be the "maximum limit before an instructor is forced to incorporate more time-saving, but less academically meaningful assignments to the detriment of student learning and, ultimately, student achievement," the authors wrote, noting this "tipping point" premise is supported by research on K-12 instruction.

The tipping point theory may also explain why most students in extra large and oversize classes "appear to experience either no increase in student achievement or an outright decline."

Joshua Eyler, director of faculty development at the University

of Mississippi and author of *How Humans Learn: The Science and Stories Behind Effective Teaching*, said, "I know people who lecture to 10 students and others who do true active learning with hundreds. Smaller class sizes can free up time faculty would spend on grading and prep that would allow them to focus more on engaging students and larger classes can sometimes discourage innovation because of the extra time for grading and prep."

Yet "simply creating smaller classes by itself does not incentivize faculty necessarily to use more engaging, evidence based pedagogies," Eyler said. Innovation in teaching "has to be rewarded by the institution in areas where it matters in order to provide the environment where faculty will choose to take the opportunity afforded by smaller class sizes to use more engaging

Much Ado About Class Size (cont.)

strategies.”

By the same token, Eyler continued, “faculty who teach large courses will sometimes make the choice to use active learning strategies,” usually in where the incentive structure rewards those efforts.

Study Design

The study involved a whopping 8,000 courses within Temple core undergraduate program, across 14 academic terms. The sample included 172,516 grades from 32,766 students. Researchers used what they call a cross-classified multilevel model and loaded it with 14 variables -- six regarding students and eight for instructors and courses.

Student success is defined by course grades, and there is standing disagreement among teaching and learning scholars as to [how much grades mean](#), if anything. The study doesn't take on that issue but rather seeks to measure how students fare by that measure, as compared to their peers, controlling for many other variables.

Lead author Ethan Ake-Little, now executive director of the American Federation of Teachers for Pennsylvania, ran the study when he was a graduate student working as a researcher in the provost's office at Temple and dealing with real, policy-oriented questions about class size and student success.

At a big public institution such as Temple, it's not possible to offer all students intimate class settings across disciplines. So Ake-Little and his co-authors wanted to better understand the effects of different class sizes on different demographics in different disciplines, to potentially maximize those effects where possible.

Essentially, they wanted to know how student race, gender and class



I know people who lecture to 10 students and others who do true active learning with hundreds. Smaller class sizes can free up time faculty would spend on grading and prep that would allow them to focus more on engaging students and larger classes can sometimes discourage innovation because of the extra time for grading and prep.



size affect student performance in the social sciences, natural sciences and arts and humanities general education courses.

And to the ongoing discussions about class size, they wanted to add a more “robust quantitative analysis that incorporates a broader range of student and class-level variables,” including those that control for instruction and student experience.

Ake-Little and his colleagues converted letter grades to their 4.0 equivalents, and demographic data about students were merged with their admissions information on high school grade point average and SAT math and verbal scores.

The data set was then combined with information on instructor rank, years of teaching experience and number of times the instructor had taught the course in question -- along with course-level aggregated data gleaned from student evaluations of teaching on students' level of interest, expected grade in the course, hours per week spent working on the course and overall student perception of their own preparation.

The 10 general education areas studied also were categorized into three domains, to fit the premise of the study: social sciences, STEM and arts and humanities.

Course size was also adjusted for purposes of analysis. Small class sizes were fewer than 25 students, medium class sizes were 26 to 30 students and large classes were 31 to 40 students. Extralarge classes were 41 to 60 students, and over-size classes had more than 61 students.

Generalizability and Implications for Faculty Development

How applicable are these findings? The authors are confident that Temple, a research institution with high enrollment and combined math and verbal SATs scores at the 55th percentile, “makes it possible to apply our findings and recommendations to a myriad of public institutions.” The large sample size and variety of variables and interactions studied makes the results similarly generalizable, the authors say.

Ake-Little and his colleagues say their findings have implications for program evaluation and faculty de-

Much Ado About Class Size (cont.)

velopment.

"Given the highly variable effects of class size by student race, gender, and academic discipline, it would be challenging to employ a 'one-size-fits-all' policy throughout the entire program," they said. "Although we can argue that smaller class sizes improve pedagogical and curricular quality, research has shown a more valuable (and perhaps realistic) policy intervention might be to provide instructors with the professional development needed to meet individualized student need."

For instance, they said, "because many first-generation minority students often have [trouble] developing study and time management skills and experience more difficulty navigating institutional bureaucracy, encouraging support groups and expanding access to critical academic resources may help bolster academic performance and retention for these students."

It is possible, then, they continue, "that underrepresented students may need more significant individualized support and attention from their instructors akin to what their overrepresented peers have experienced to date."

Ake-Little said that his next project will involve pairing these data with corresponding instructor feedback forms, to study the effects of teaching style on student success, with an eye toward class size.

On Remote Instruction and Future Research

The study considered only non-honors, nononline, single-instructor courses, so it is very much a reflection of pre-COVID-19-era teaching. Even so, Ake-Little said the findings are relevant to remote and mixed-methods teaching in that they offer more flexibility with regard to class size than traditional

“

Although we can argue that smaller class sizes improve pedagogical and curricular quality, research has shown a more valuable (and perhaps realistic) policy intervention might be to provide instructors with the professional development needed to meet individualized student need.

”

face-to-face classes.

"In theory, you can take 100 students in an online class and essentially make it into smaller classes," Ake-Little said. "This is especially true as the idea of asynchronous learning takes off."

There's more flexibility with class scheduling now, too, he said, in that professors can break down class blocks into "segments" that meet more regularly for shorter periods of time.

"Dealing with what's physically in front of you is not a requirement anymore," excluding more process-oriented courses, such as music, he said. "The question is, how do I schedule the content delivery?"

Christopher Doss, a researcher at the RAND Corporation, co-wrote a 2017 study, [previewed in 2015](#), that found small class size changes have little impact in an asynchronous, online class setting -- something that may be especially relevant now.

Doss said the big takeaway from Ake-Little's study is that "class size is not a monolithic construct that has just one effect." Many factors

can cause the effect of class size to vary, he said, including how instructors react to larger classes, how students react to larger classes, the subject area and exactly how big those classes are -- not just "big" or "small."

Past studies, including Doss's own, have tried to understand that, he said, but the new research is "explicitly trying to model how those differences might occur, which is helpful."

Echoing a point the paper makes, Doss said the models are correlational, not causal, "so we can't make any strong claims that these factors actually changed the effect of the class size." But it "does represent a good starting point to think about these things more deeply."

Taken together, Doss said his and Ake-Little's studies "suggest that the effect of larger class sizes in online classrooms may be different than in-person because the underlying mechanisms of how class size affects students are important considerations and, by necessity, classes online have to look and function differently."

Doss's study suggests that class

Much Ado About Class Size (cont.)

size effect is smaller in online classes, "but that is just one study looking at one flavor of online classes in one context. More research is obviously needed," he said.

Cissy Ballen, now an assistant professor of biology at Auburn University, led a [2018 study](#) that found smaller classes help reduce performance gaps in science fields -- to a degree. While women underperformed on high-stakes exams compared with their male counterparts as class size increased, women received higher scores than men on other kinds of assessments.

Underrepresented minority students, meanwhile, underperformed compared with other students regardless of class size, suggesting that other factors in the educational environment are at play.

Ballen said the new paper matters because so many institutions are "grappling with the question of class size to accommodate more students, and there are not many studies rigorously addressing this

issue," at least in higher education, where class size is not regulated.

Noting that Ake-Little and his colleagues were careful not to endorse large classes, Ballen said the message was rather to "encourage instructors teaching large classes to seek professional development in order to meet students' needs."

The results point to the need for similar analyses of even bigger courses, such as 700-student lectures, Ballen also said.

"As these arena-style classrooms become the norm at public colleges and universities, I think these sorts of studies will be critical to inform policy discussions."

As for COVID-19-era teaching, in which arena-style classes are on pause, Ballen said, "Large classes, like online teaching, relate to making education more accessible to a larger number of students." Future work can apply these methods to student performance in virtual classrooms of variable sizes, she added.

Ake-Little said that focus groups

with students preceded his work on class size. And some of the comments by the group members support these quantitative findings, he said, in that students have a variety of reasons for choosing larger class sizes -- including the presence of friends who may serve as a support or study group.

Sometimes students choose bigger classes because they're more likely to have a bigger online presence, meaning that missing some class sessions for a job or other personal obligation won't be catastrophic to one's grade. These kinds of student needs have always existed, particularly among underrepresented minorities, he said, but have really come to the fore during COVID-19.

In any case, Ake-Little said his approach was not to make any sweeping recommendations based on his study.

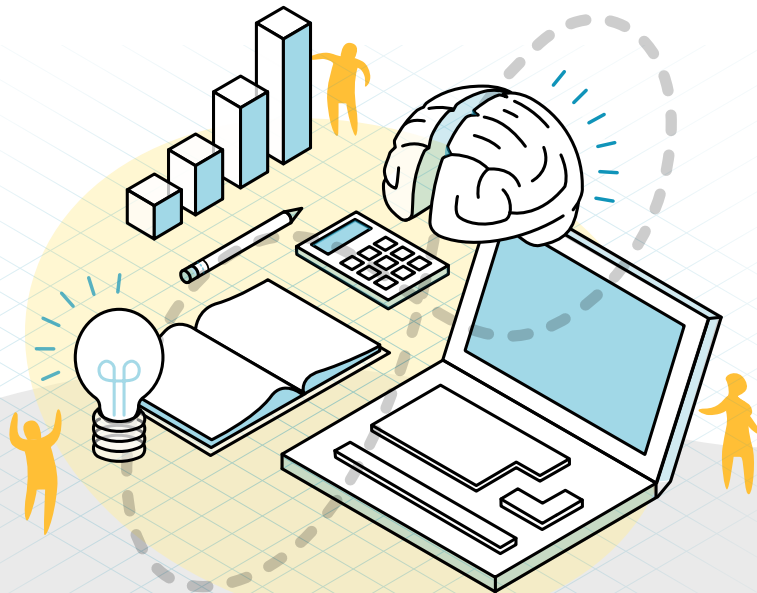
"This is about who's getting a boost and who's not," all things being equal, he said. ■

[Read Original Article](#) ▶▶

<https://www.insidehighered.com/news/2020/06/18/study-some-things-matter-more-class-size-when-it-comes-student-success>

DigitalEd

Individual learning in a shared world.



DigitalEd is an online learning company with a simple and resonant purpose – to shape the world through digital learning. Our online learning platform, Möbius, specializes in creating and deploying online STEM courses with industry leading content, lessons, and assessment.

Visit [DigitalEd.com](https://www.digitaled.com) for free resources to help with online learning:

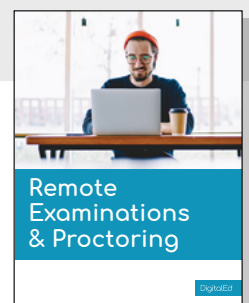
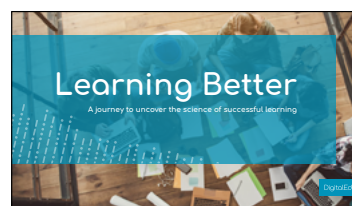
[Remote Examinations and Proctoring](#) | *Whitepaper*

[Greater Engagement & Accessibility In Mathematical Sciences](#) | *Case Study*

[Designing and Delivering Online STEM Courses](#) | *Webinar*

[How to Approach Online Learning](#) | *e-Book*

Access over 40 whitepapers, e-books, webinars, and case studies now.



info@digitaled.com



www.digitaled.com

DigitalEd

What Worked This Spring? Well-Designed and -Delivered Courses

Professors and students alike viewed their remote learning experience most favorably this spring when their courses incorporated more "best practices." That's the path to making the inevitable virtual education better this fall.

By [Doug Lederman](#) // July 8, 2020

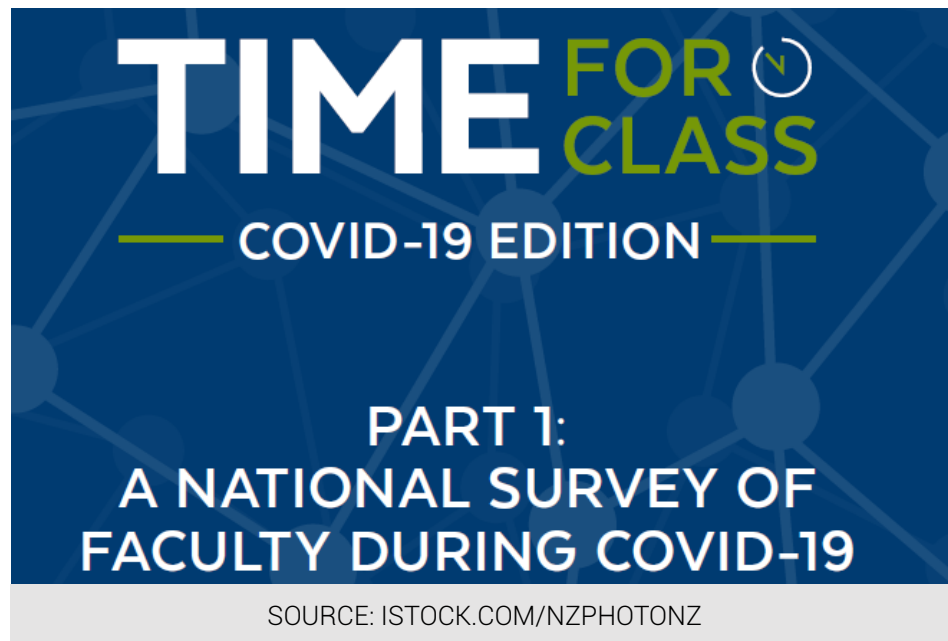
The conventional wisdom holds that most students and instructors alike were deeply dissatisfied with their experiences with emergency remote learning this spring. Numerous surveys of students and parents have said as much, and many college leaders seem to be taking those attitudes to heart in their planning for fall. In announcing that they will return as much as possible to in-person instruction, more than a few have cited dissatisfaction with virtual learning as a factor, along with significant financial and cultural reasons.

As is often the case, though, a more thorough and nuanced look tells a somewhat different story.

Two new studies out today add to our understanding of how students and professors viewed their experiences with remote learning last spring after colleges were forced to close their campuses in response to COVID-19.

The nationally representative surveys of more than 1,000 undergraduate students and 4,000 instructors from 1,500 colleges reinforces the prevailing view that many instructors and students were not happy with how the spring went. The proportion of students saying they were highly satisfied with their experience in a course important to them fell from 51 percent pre-COVID to 19 percent post-COVID, and three-fifths of instructors said they struggled to keep students engaged.

But as is true of classroom instruction, too, not all courses are made the same. As instructors abruptly



adapted their in-person courses to be delivered virtually over a matter of days in March, some more than others incorporated a set of practices widely embraced as contributing to high-quality virtual learning. And when courses were designed or delivered using significant numbers of those practices, students and professors alike were much likelier to express satisfaction with their experience, to feel engaged.

As I'll try to explain in more detail below, the implications for fall -- especially if, as seems likely, large proportions of students will be learning virtually, whether they're on campus or not -- are significant: making virtual learning better isn't an insurmountable mountain to climb. It's about making each course a little better, a bit more based on proven practices and a little more likely to keep students

feeling connected and engaged. (And to put it in language that campus administrators might appreciate, maybe, just maybe, less likely to demand a tuition refund or to drop out.)

The studies released today by [Digital Promise](#) and [Tyton Partners](#), both of which are part of the Every Learner Everywhere network, are arguably the most comprehensive surveys to date of student and faculty perspectives on the spring's remarkable and abrupt transition to remote learning by the vast majority of the country's colleges, students and professors.

The surveys were conducted independently, and each has free-standing findings worth exploring on their own. For purposes of this column, though, I'm most interested in where they intersect and how those findings can inform how pro-

What Worked This Spring? Well-Designed and -Delivered Courses (cont.)

fessors, instructional staff members and campus administrators approach instructional delivery this fall.

(An up-front bias I'll admit right here: while I understand why many students, parents and college leaders are eager for students to return to physical campuses this fall, I fear it's not going to go well and that, for COVID-19-driven reasons, many if not most students will end up studying heavily if not entirely online this fall. Now back to our originally scheduled programming.)

In "Suddenly Online: A National Survey of Undergraduates During the COVID-19 Pandemic," Digital Promise and Langer Research administered their "Survey of Student Perceptions of Remote Teaching and Learning" to 1,008 students in credit-bearing courses that were delivered in person at the start of the spring and remotely by March. Respondents were asked to focus on one course for purposes of the survey -- either a science, technology, engineering or mathematics course if they took one (because

"STEM courses are typically the most challenging for students") or the course "they thought was most important for their future goals."

Key findings of the student survey include:

- Despite the widely caricatured sense that all professors did this spring was sit in front of their computer camera and lecture to students on Zoom, nearly two-thirds of students reported that their online course included live sections to ask questions and discuss content (67 percent), recorded lectures (65 percent), and frequent quizzes and assignments (64 percent). Three in five said their courses included live lectures, and a quarter (25 percent) said their course used breakout groups during live classes.
- Student satisfaction absolutely dipped after the move to remote. The vast majority of students described themselves as either very (51 percent) or somewhat satisfied (36 percent) with their courses pre-COVID, and just 59

percent said they were satisfied (19 percent "very") after the move. In general students didn't blame their instructors: 76 percent said they were satisfied with their professor's preparation (37 percent very satisfied) and 68 percent with the quality of instruction, but 57 percent were satisfied (17 percent very) with their overall learning. Asked to say specifically what diminished their experience with the remote courses, students were most likely to cite lack of interactivity, with 65 percent saying that "opportunities to collaborate with other students on coursework" were lacking in the online course.

- Hispanic students were disproportionately challenged by the shift to remote learning. Students were given a list of potential problems stemming from the transition, and Hispanic students were more likely than their peers to characterize them as major in almost every case, as seen below.

FIGURE 7. PERCENT OF STUDENTS EXPERIENCING PROBLEMS AS "MAJOR," BY RACE/ETHNICITY

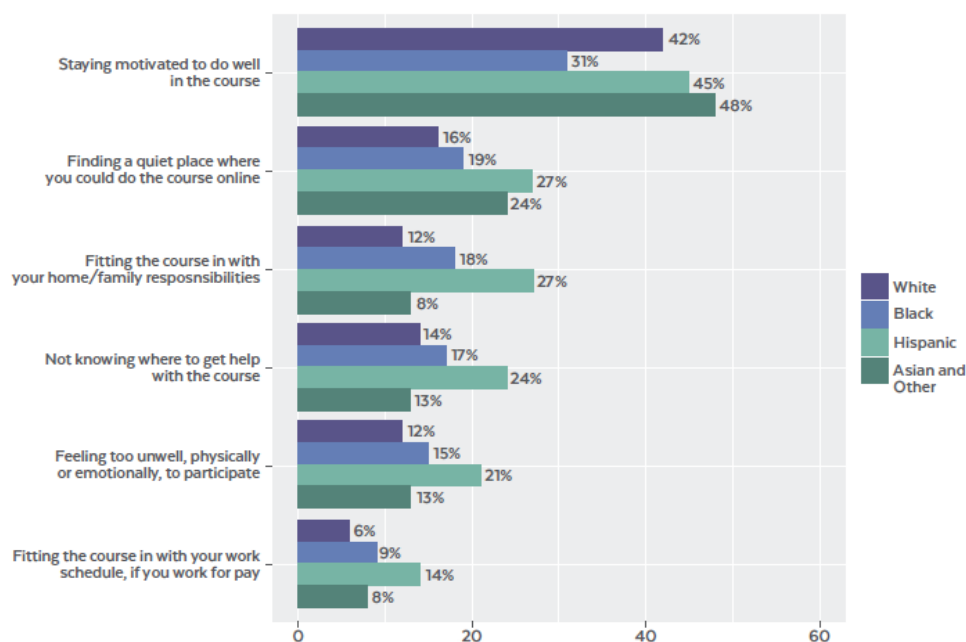
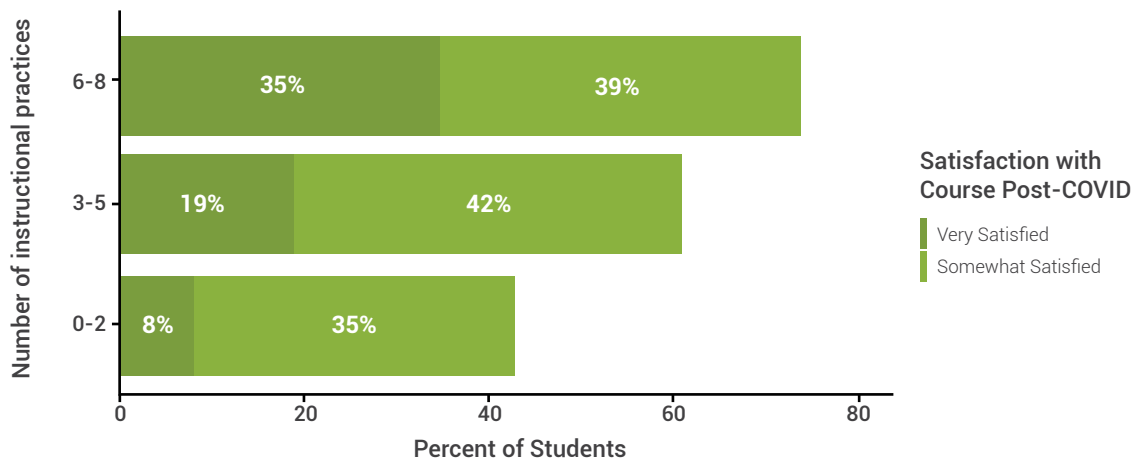


FIGURE 8. SATISFACTION WITH POST-COVID-19 COURSE BY NUMBER OF RECOMMEND ONLINE PRACTICES USED



Note: Practices in italics are those deemed "recommended" by Digital Promise.

More to the point of this column, the student survey asked respondents which of a set of 11 instructional approaches their chosen course had used (see the list in the table later in this article), and compared those answers to their judgments about course satisfaction.

The results were probably not surprising: students who said their courses had utilized at least six of the eight practices that Digital Promise (based on a review of pedagogical research) deemed "rec-

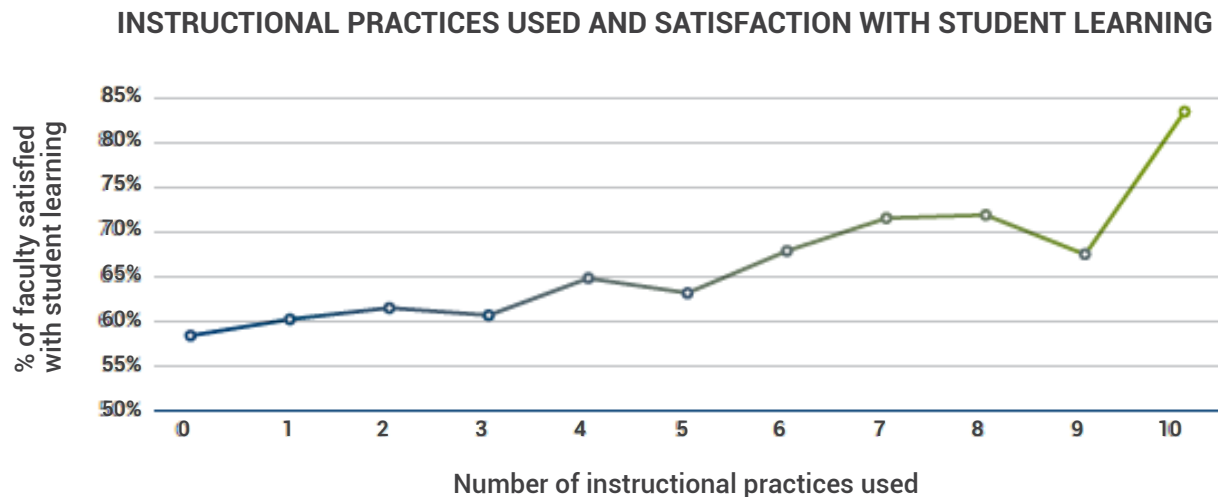
ommended" were far likelier (74 percent) to say they were satisfied with their remote learning course, 35 percent very satisfied. By comparison, 43 percent of students who said their course used two or fewer of the eight practices said they were satisfied, only 9 percent very much so.

Perusing the list of practices that students (and instructors, incorporating data from the Tyton Partners survey of professors) say their courses used (and didn't) makes

it clear why many students found their remote learning experiences lacking in interaction and engagement.

Just a third of students (33 percent) and instructors said their courses allowed for group work and only a quarter broke students into smaller groups to allow for interaction among them during live classes. Only about a third of students and instructors said they broke course activities into smaller units.

Instructional Practices	Students		Instructors	
	2-Year	4-Year	2-Year	4-Year
<i>Live sessions for asking questions/participating in discussions</i>	59%	71%	67%	72%
Real-world examples	64%	67%	49%	53%
Recorded lectures	54%	69%	55%	58%
<i>Frequent quizzes</i>	72%	60%	53%	44%
Live lectures by the instructor with students watching	56%	62%	44%	46%
Videos from external sources	57%	53%	59%	47%
<i>Personal messages from the instructor</i>	66%	49%	79%	72%
<i>Assignments having you express what you had learned</i>	54%	46%	45%	40%
<i>Breaking course activities up into shorter pieces</i>	40%	32%	34%	38%
Group projects	25%	37%	22%	31%
Breakout groups during a live class	24%	25%	--	--



"Issues of motivation and engagement came through really strongly in these studies," said Barbara Means, executive director for learning sciences research at Digital Promise. "A strong part of that comes from a sense of contact with their instructor and their peers. Peer contact is really important."

The Instructor View

Students weren't alone in having their own satisfaction with the remote learning experience depend on how their courses were taught. More than 60 percent of the 4,798 instructors who responded to Tyton's survey, "[Time for Class: A National Survey of Faculty During COVID-19](#)," cited "keeping my students engaged" as their biggest challenge as they transitioned from face-to-face or hybrid courses to remote learning this spring.

Instructors who varied their techniques and used more of the practices listed above were more satisfied with the learning their

classes enabled for students, as seen above.

Here's the catch, though: "Only 20 percent of the faculty were in the group that used the largest range of instructional practices," and therefore were most satisfied with the learning, said Kristen Fox, a director at Tyton.

Those instructors were about twice as likely as the other 80 percent of professors to have had prior experience teaching online, and they were significantly likelier to say they had access to a campus-based teaching and learning center or other meaningful form of institutional support.

Looking Ahead

Given where we are in the calendar, assessing what unfolded in the spring is useful mostly to the extent it can guide colleges, faculty members, instructional staff and administrators as they prepare for a quickly approaching fall.

Consistent with the findings de-

scribed above, three-quarters of instructors surveyed by Tyton cited "increasing student engagement in class" as an instructional priority for the fall, followed by "building a course that can be transitioned between face-to-face and online environments and ensuring accessibility for all students," both chosen by under half of them. Like the Digital Promise survey of students, the faculty survey underscores several ways that already disadvantaged students were further disadvantaged in the shift to remote learning.

The list of faculty priorities for fall suggests, Fox said, that the remote spring not only made instructors more aware of the challenge and importance of engaging their students in remote settings, but "opened their eyes to the challenges of students day to day," and the centrality of the online professor's role as the "tip of the spear" helping students find support. ■

[Read Original Article](#) ▶▶

<https://www.insidehighered.com/digital-learning/article/2020/07/08/what-kept-students-studying-remotely-satisfied-spring-well>

'On My Own'

Author discusses her new book on community college STEM transfer students -- and the challenges they face amid the coronavirus.

By **Scott Jaschik** // March 24, 2020

Community college transfer programs face challenges both at their home institutions and at the institutions to which students want to transfer. Add STEM to the equation and the challenges grow. Xueli Wang, a professor of higher education at the University of Wisconsin at Madison, explores those challenges and the way students meet them in *On My Own: The Challenge and Promise of Building Equitable STEM Transfer Pathways* (Harvard Education Press). The book follows 1,670 community college students for four years as they transfer to four-year institutions.

Wang responded to questions about the book via email.

Q: The title of your book, *On My Own*, suggests that the students who succeed do so because of their own attitudes. Is this what you wanted to convey?

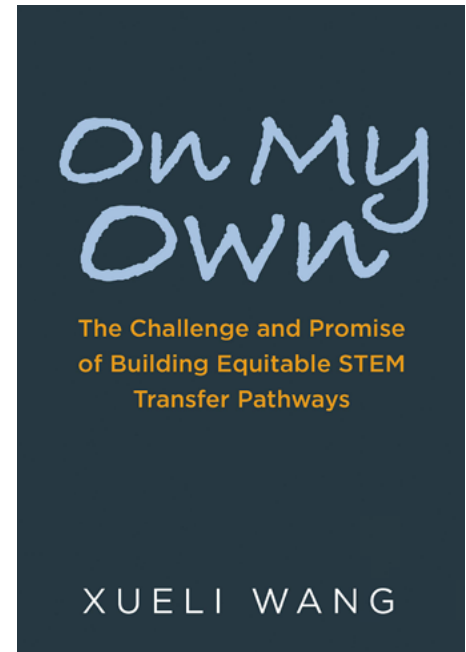
A: The meaning of *On My Own* is actually more nuanced and multifaceted, although it indeed highlights the students as agentic individuals. My book details four different trajectories transfer-aspiring students landed on four years after they enrolled at their two-year institutions: linear upward, detoured, deferred and taking a break. As these trajectories suggest, not all students "succeeded" if we look at transfer as a simplistic yardstick. However, the students across all trajectories were remarkably motivated and resilient. They often held on to their high aspirations, strong sense of agency and perseverance, which are also a complex manifestation of pre-existing tendencies of

self-reliance and hesitance in seeking help, especially among many students of color and first-generation students. This is the internal facet to *On My Own*.

However, there is also an external facet to *On My Own*. The students did describe positive experiences with individual advisers and instructors, but over all, they received limited intentional, on-point institutional support that translated into a clear path toward a baccalaureate STEM education. Numerous external structural challenges (described below), on the part of transfer-sending and transfer-receiving institutions alike, plagued students' journeys. Altogether, my book reveals that the students were pushing through external friction points, fueled for the most part by their own motivational momentum, a testament of the incredible talent pool these students represent. But to fully realize the STEM transfer promise, the external *On My Own* must be disrupted, so that the internal *On My Own* can become an asset if needed, instead of these students' sole lifeline.

Q: What are the main problems facing STEM students at a community college who want to transfer?

A: Community college students often navigate a number of structural issues when seeking transfer. First, the students I studied encountered a lack of clear articulation in courses that applied to specific STEM majors. The vague alignment between course and major



requirements made it difficult for the students to match up the right courses with program requirements. This usually left them with excess credits that did not count toward their intended STEM major. Second, there were no clear course pathways that fit students' scheduling needs in light of life and other school obligations. This is a prominent concern for STEM transfer, as STEM subject matter courses tend to be offered in a granularly sequenced, time-constrained manner. This works against community college students' need for greater flexibility in course options and availability, leading to a prolonged or even derailed transfer path.

Third and perhaps most concerning, financial support for transfer students was sorely absent, compounded by a lack of articulation agreements between public

institutions. This left transfer-intending students with no affordable choices but a few options with expensive private four-year institutions -- options that were simply out of question because of their high price tag. All of these structural issues fed into one another to present enormous challenges for the students, many from low-income backgrounds who needed to work and ultimately were forced to make the difficult choice between transfer and work. These were just a few of main problems the students faced. I lay these and others out in greater detail in my book.

Q: Based on the students you studied, do they receive good academic advising?

A: The short answer is yes and no. Yes in the sense that some students did encounter supportive advisers here and there, but in a highly incidental, individual and unsystematic way. No because largely, the students still felt they were on their own, and the information and resources at their disposal varied widely. Largely owing to an untenable advising load, there were limited time and space, with only small pockets of students able to access and use advising services. These issues were further compounded by pre-existing and lasting disparities in the students' backgrounds and needs, which inequitably shaped their advising experiences. This, however, is not to place fault on individual advisers, who are often overworked, trying to meet the needs of a diverse student population faced with myriad options. My book highlights a set of systemic issues that pose real challenges that constrain advisers from fulfilling their role in sustainable ways. This hearkens back to larger issues of limited state and federal support for community col-

“

This is a prominent concern for STEM transfer, as STEM subject matter courses tend to be offered in a granularly sequenced, time-constrained manner.

This works against community college students' need for greater flexibility in course options and availability, leading to a prolonged or even derailed transfer path.

”

leges, resulting in an underfunded, underresourced advising system that must be remedied.

Q: What should programs do to make it easier for community college students to transfer into them?

A: I want to preface my answer by calling program leaders and faculty at transfer-receiving institutions to be an equal, active and proactive partner in supporting transfer students. The students in my book were deeply impacted by both ends of the process of wading through articulation and transfer. Transfer is *not* a community college concern alone. It takes the entire postsecondary sector to pave the transfer process. First, both transfer-receiving and -sending institutions must actively and collaboratively flesh out institution- and program-specific articulation agreements. They are best positioned to account for changes in requirements and other regulations.

Second, program faculty at both of these institutions are equally responsible for equally important areas and stages of learning. They must engage in co-creating learning objectives, streamlining courses across institutions and align-

ing course requirements, especially as they share the common desire to be responsive to their students' success. For baccalaureate programs that attract a lot of transfer students, faculty and advising roles and responsibilities should explicitly include transfer efforts.

Third, programs should revisit academic scheduling to address narrow access to transferable STEM courses and programs. Optimize scheduling based on when students can actually take them instead of what was always done in the past. One option is block scheduling, which would allow students to attend several classes during a concentrated time window. This can make more efficient use of their time and reduce transportation barriers and conflicts with external commitments. Last but not least, STEM programs might reconsider their current structures and sequences. For example, does math have to be the first “gatekeeper”? My research suggests that STEM transfer-aspiring students would benefit from the opportunity to first explore the STEM subject matter of their interest, followed by math offerings. Allowing space for this kind of in-

tentional flexibility would broaden access to transferable courses and embrace the multifaceted lives and interests of the students.

Q: What does a good transfer opportunity look like?

A: A good transfer opportunity first consists of making transfer an integral part of the financial aid system without full-time enrollment strings. That way, students from diverse backgrounds are intentionally served and can choose *both* school as *well* as work and family. Second, clear and collaborative institution and major-specific articulation agreements can ensure seamless transfer of credits that count toward both major and degree completion. Third, access to transferable STEM courses with flexible program sequencing to account for the many life contexts and realities of community college students would be in place. Fourth, students would have equitable and easy access to well-informed guidance about all of the above.

Structurally, a good transfer opportunity is made possible when transfer support spaces are broadly and collaboratively conceived and constructed, spanning both the transfer-sending and -receiving ends, and blurring the "boundaries" between advisers and faculty. Operating from this collaborative approach, transfer support includes early, regular contact and setting clear paths from the onset. It also entails carefully built genuine relationships with faculty/advisers equipped with relevant knowledge and skills to empower students to succeed. Of course, there are additional societal and external structural issues that require disrupting to further realize equitable STEM transfer opportunities, which I discuss in length in my book.

Q: You wrote your book before

“

I know firsthandly, leaders at the research sites covered in my book have been working around the clock, showing up to this massive challenge. What is being done at community colleges should be highly publicized and lauded, as these institutions, albeit imperfect, are among the most socially responsive and innovative ones

”

the crisis of COVID-19, but are there lessons from your book for institutions trying to serve community college students or transfers?

A: Much as I was excited about the upcoming release of my book, in the wake of COVID-19, any personal accomplishment I feel as an education researcher seems so trivial. The unprecedented crisis of COVID-19 poses extraordinary issues of concern, and I did find some lessons within the book that have magnified the implications for institutions serving students during this turbulent time. In general, I encourage institutions to consider the following two questions as a guide to their quickly evolving efforts.

First, how do the efforts we are developing affect our most vulnerable students? Protect the most vulnerable students, including low-income, students of color, students with mental health issues, students with varying learning abilities, immigrant and undocumented students, and international students, among others. During any other occasion, these students' *On My Own* tendencies are to be admired, but they

remain problematic as discussed in my book. In times like these, vulnerable student populations undoubtedly experience exacerbated challenges, and *On My Own* is simply not an option.

Second, who are our partners in these efforts? The very unique nature and strengths of community colleges lie in their close ties to the community. Many have extensive connections with and contributions to industry, community organizations, outreach and resources, as well as relationships with other education sectors. This is where colleges must appeal to communities, industries and other institutions to identify crucial partnerships toward fulfilling important education, health, economic and broader societal needs.

Starting from these two principles, below I offer a few more specific directions based on my book, highlighting some useful resources and examples that have rapidly emerged. But let me first start by stating that community colleges are remarkably agile social institutions, historically known for their adaptability and responsive-

'On My Own' (cont.)

ness to emerging social challenges. I know firsthand, leaders at the research sites covered in my book have been working around the clock, showing up to this massive challenge. What is being done at community colleges should be highly publicized and lauded, as these institutions, albeit imperfect, are among the most socially responsive and innovative ones.

To begin, the COVID-19 crisis has propelled many two-year colleges to move their instruction online, and this shift came with major consequences. Immediately urgent is that many students have very limited financial means, often without access to high-speed internet or a computer at home. Institutions need to ensure that such resources are accessible to students who have no other option. The library at [Owens Community College](#) in Ohio remains open for this reason.

Another solution would be providing or loaning laptops to students. [Foothill College in California](#) has an emergency relief fund for students to request up to \$1,000 for a laptop and Wi-Fi hotspot. [Columbia Gorge Community College in Oregon](#) has computers available for checkout. Plus, collaboration with business entities to offer low-cost or no-cost computers and internet services represents a viable option, especially for two-year institutions with strong ties to particular industries. The [North Carolina Department of Information Technology](#) provides a list of internet and mobile providers offering free or affordable services across the state.

Online instruction also places a heavy constraint for STEM courses that require labs, workshops and other hands-on learning experiences not immediately suited to a

virtual environment. These activities may need to be modified with [increased cleaning and distancing students in rooms](#). But as the pandemic quickly evolves, this may change and caution must be exercised. Institutions will have to view this as a learning process as they adjust for each course and its individual context, and possibly consider simulations and other modified activities.

Beyond learning, we must not forget that students are humans first and foremost, and many are balancing multiple obligations, trying to make ends meet even during "regular" times. In the current crisis, these challenges are further aggravated as hundreds of thousands have lost jobs, and this number continues to grow with each passing day. The [Hope Center at Temple University compiled a guide](#) that provides valuable recommendations and resources with regard to access to health care and food, emergency aid due to unforeseen expenses and/or loss of wages, housing arrangements, along with financial and instructional considerations. These challenges can be amplified for students with mental health issues and/or learning disabilities, as I found in my book. This makes the suggested supports and services even more crucial during a time of social distancing. As an example, [Leeward Community College in Hawaii](#) continues to offer counseling services via phone and Zoom. Without these services, students' well-being can be put at risk.

Let's also remind ourselves that the community college often becomes one of the most stable and consistent facets of students' lives. During this time of crisis, it is crucial that institutions stand by all their

students but especially those from minoritized backgrounds. This is especially poignant with the blatant bias, racism and xenophobia related to COVID-19. Institutions need to send a strong and clear message, like [Columbia Gorge Community College in Oregon](#), that such behavior is not acceptable and where to report incidents of bias and harassment.

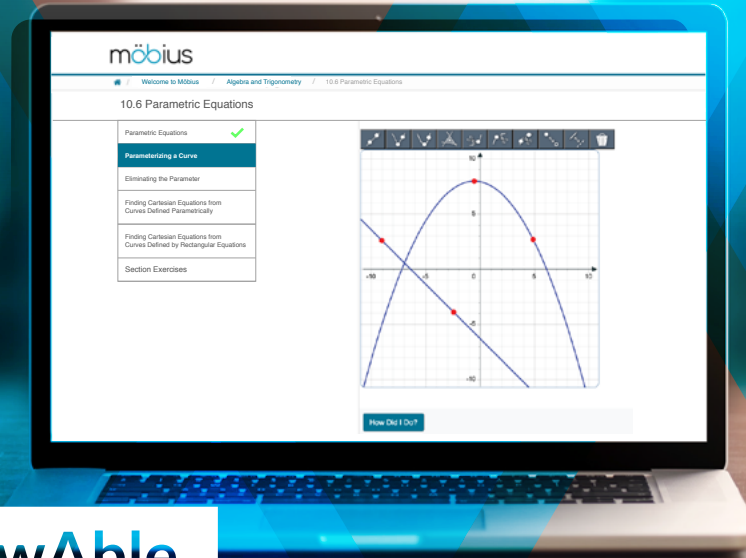
As for transfer, the process may be further disrupted during this crisis, leaving students in need of support, flexibility and extended timelines. How institutions, especially those on the transfer-receiving end, respond to and account for transfers is paramount. Are they looking at these students as limited defined enrollment numbers, or are they seeing the whole student and the incredible talent they can help cultivate through a baccalaureate STEM pathway?

The COVID-19 crisis points to the urgency in developing STEM professionals to address the societal, community and health needs. The consequences of this pandemic will arguably impact education, technology, the economy and society profoundly in the years to come. Community colleges and their students are primed to rise to the occasion and come up with creative and innovative solutions. Community colleges and their students know, represent and respond to the community the best, as illustrated by the many STEM transfer-intending students in my book who were entrenched in and geared up to serve their local communities with the education they need. There has never been a greater or more critical need to enroll and support STEM transfer students. Now is the time. ■

Read Original Article ▶▶

<https://www.insidehighered.com/news/2020/03/24/author-discusses-new-book-stem-transfer-students-community-colleges>

möbius

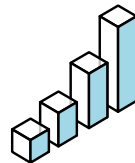


Make it KnowAble.

Enable the shift from the unknown to the KnowAble with Möbius, the online learning platform for deploying STEM courses online.



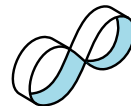
Möbius is ideally suited for complex online math-based STEM disciplines with its **world-class math-engine**.



Möbius uses **powerful multi-media visualizations** to anchor key STEM concepts.



Provide students with **immediate and meaningful feedback** and provide instructors with data on student engagement and understanding.



Go beyond simple questions types with algorithmically generated and randomized questions.



Access to **high-quality content** created by curriculum experts ready to deploy quickly and easily.



Find out why top STEM schools around the world choose Möbius to teach their online math-based STEM courses.

Visit www.digtaled.com/platform.



info@digtaled.com



www.digtaled.com

DigitalEd

Remotely Hands-On

| Teaching lab sciences and the fine arts during COVID-19.

By Colleen Flaherty // April 14, 2020

Line by line and curve by curve, Michael McGreal recently transformed a block of ice in his backyard into a swordfish. He drew a small, socially distanced crowd as he went: the buzz of his chain saw and the spectacle of ice carving during a pandemic caught the attention of some passersby.

McGreal was happy to provide distraction and a bit of beauty in a strange time. But this was about work. The chair of culinary arts at Joliet Junior College near Chicago was taping himself for an upcoming meeting of his ice-carving class. Typically, he makes swordfish live on campus in front of students, who then chisel away at their own blocks of ice with power tools.

But this is the COVID-19 era, in which instructors who teach fundamentally hands-on courses across fields are finding ways to make remote learning work.

"It's not as difficult a transition as I expected," said McGreal. "The labor part of it is a lot," he admitted, "setting up our homes to do cooking videos live and taping them. And a lot of us have children at home now."

At the same time, McGreal continued, "it's an exciting chance for us to do some things for an online format that will make our face-to-face classes better than ever before."

Take ice carving. McGreal plans to save the videos he's made of fish and swan carvings for his students this semester and share them with his classes going forward. That way, he said, students can watch the videos in advance of class and be more prepared to attempt their

own sculptures when they meet.

There's something intimate and effective about asking students to watch their instructors cook and bake in their own home kitchens, McGreal said, even if they're not cooking on their own now. (The department discussed asking students to cook along via Zoom but decided it was unwise to ask students to pay and even shop for ingredients. Still, many students stuck at home have been cooking on their own and sharing photos with their instructors and peers on chat boards.)

"They're coming into our worlds now instead of a steel, sterile classroom, and it makes you feel more comfortable," McGreal said. "Students seem to be loving it."

McGreal's students are in the hospitality business, after all, he added.

Comfortable doesn't mean sustainable, however. McGreal said his department's mostly synchronous cooking sessions, which are later posted to YouTube for students who can't watch live, are working because students spent at least eight weeks on campus prior to going remote. During that time they learned fundamental techniques in cooking, baking and carving, hands-on. Most of what they're learning about now, by watching their instructors cook, is the sophisticated application of those skills. It's hard to imagine that this *Food Network*-inspired approach to culinary education could work long-term without that kind of introduction, he said.

Remote STEM

Michelle Stocker, assistant professor of geobiology at Virginia



Michael McGreal prepares an ice sculpture at home for his ice-carving class at Joliet Junior College.

Tech, agreed that "for this semester we can make it work. I wouldn't necessarily say we like doing this at all, though."

Aided by the many scholars of anatomy who have rushed to share 3-D mesh and other kinds of skeletal images online over the last six weeks on such websites as MorphoSource and Sketchfab, Stocker has been able to continue teaching a lab course on vertebrate morphology with relative ease. Even so, one graduate student in the mixed-level class already asked to sit in on it the next time Stocker teaches it, for the authentic experience. Her answer? Of course.

The upper-level course is designed to be challenging and extremely hands-on, with students handling skeletal materials for 2.5 hours at a time. Now students ex-

amine specimens online in Zoom sessions. Stocker, who also took physical specimens home with her, sometimes logs in on a second account to magnify them with her cellphone camera. Because Stocker's students, like McGreal's, spent weeks on campus before going remote, they remember these specimens -- down to the way they smell.

Even so, students can't interact with the materials as they can in the lab. So Stocker asks them to interact with each other more. Students are encouraged to virtually share bones they found on COVID-19-safe walks in the woods, for example, and the class works to identify the animal and what might have happened to it.

This is also a way to counter the Zoom fatigue that many professors report: teaching remotely, it seems, feels more tiring than teaching in person, because it's hard to gauge student reactions.

"Talking to yourself for a long time can be super boring," Stocker laughed.

Julia Svoboda Gouvea, assistant professor of science education at Tufts University, coincidentally taught a computation-based module on the flu in her organisms and populations lab at the beginning of the semester. The goals of the project were to track the flu season on the genetic sequencing database Nextstrain and ultimately recommend a course of action to the World Health Organization for next year's flu season. But students became more and more engaged in tracking COVID-19 as the weeks wore on.

"They could see how the transmission process was happening" via the genomic sequencing data on Nextstrain, Gouvea said.

Students had time to move on to another design-your-own-experi-



The labs that I design are very discretion-based. They're hard for students and we use real data, not a pretend lab activity.



ment unit involving the egg-laying behaviors of bean beetles before the campus closed due to the coronavirus outbreak.

By now, Gouvea said, "there are a bunch of beetles hanging out in the lab that we were never able to quantify. And students were designing these experiments knowing that they were never going to see the results, so that kind of undercut the authenticity of the activity."

Presently, students are working remotely on a unit involving plants. Gouvea converted this final section of the course into a literature-heavy one, in which students read research papers and use a collaborative commenting tool to discuss them. Students will write their own responses to the literature by the end of the term.

Some of the papers Gouvea found for this unit are inspiring her to think ahead to other possible iterations of the course. A research area about how plants communicate through volatile chemicals and their roots has Gouvea thinking that she might ask future students to buy relatively inexpensive sensors to detect volatile chemicals on outdoor plants, or those in their own homes.

Doing lab science remotely is

more than possible, Gouvea said. Still, she worried about capturing what is arguably the most important part of lab work: struggle.

"The labs that I design are very discretion-based," she said. "They're hard for students and we use real data, not a pretend lab activity." Students are often confused, in a good way, for a portion of the lab, as they ask questions and move through challenges, Gouvea said. She asked if that process can be sustained online.

To teach lab work remotely from the outset, she continued, "You're going to have to tell students it's OK not to understand this within the first five minutes of opening up a webpage."

Simulations and Accreditation

Simulated lab technologies are already available and seeing increased use due to COVID-19. Labster, for example, donated \$5 million worth of services to K-12 and college and university instructors affected by the disruption. Ten thousand instructors signed up. Program usage increased by 10 times in the last two weeks, and Labster today announced a new partnership with the California Community Colleges.

Co-founder Michael Bodekaer

Remotely Hands-On (cont.)



said the company's mission is to engage students in science, in part through gamification of lab work, and to increase access. Many institutions lack top lab facilities, he said, and even campuses with the best equipment may bar students from using their high-end tools.

Labster's modules, he said, "are like a flight simulator for pilots." The purpose is not to replace labs entirely, but to keep students interested in and prepared enough for science to excel when they get there.

Ed tech has its skeptics, and there are certainly some things it can't teach. Gouvea's colleague at Tufts, Lauren Crowe, a lecturer in biology, for one, said remote instruction prevents her from teaching her students essential fine motor skills, like using a micropipette.

Labster brings its own data to that fight, including an [article](#) in *Nature* finding a twofold improvement in students' learning outcomes after using gamified simulations. To Gouvea's point about struggle, Labster's virtual guides

sometimes allow students to fail at first.

"There are many ways you can do this, and each teacher has their own preferences, like blended learning and teachers providing courses as homework," Bodekaer said.

Accreditation is another piece of the puzzle. How do outside bodies responsible for assuring quality in hands-on programs adapt to the moment?

ABET, which accredits thousand of programs in the applied and natural sciences, computing, and engineering, has advised institutions not to alert it to short-term adaptations due to the coronavirus. Permanent changes will need to be flagged, however.

Joseph L. Sussman, chief accreditation officer at the organization, said, "We fully understand that institutions and programs are having to make accommodations to safeguard their communities and contribute to the containment of the virus."

Most important "is a program's

ongoing ability, regardless of delivery method, to demonstrate that it is enabling the achievement of the student outcomes associated with program."

Sussman added, "ABET accreditation will not be a barrier to success."

The Arts Online

In addition to many colleagues in the sciences and job training programs, professors of the fine arts are adapting deeply physical work for a whole new world.

Douglas Russell, a professor of drawing at the University of Wyoming, sent an announcement to his drawing students last month about new modules he set up for the course. There is a recommended order to moving through them, but students may proceed in any order, at their own pace. Everything is due at the end of the semester. The typical module includes an assignment, a discussion component, instructional videos and images to view, plus slides.

Russell got organized fast in or-

Remotely Hands-On (cont.)



Douglas Russel



der to offer asynchronous instruction to students who are struggling in their own ways with the realities of COVID-19. Much of his real-time work now is providing detailed digital feedback to students as they proceed. So far, he said, students seem "fairly upbeat." Some have asked to take the class on a pass/fail basis, to which Russell agreed. He plans on sending out a remind-

er next week, telling students not to wait until the end of the class to get their work done.

If time management is a challenge for students, the hardest part of teaching is "the lack of one-on-one, face-to-face instruction that automatically occurs in a normal classroom," Russell said. There is an "unfolding of back-and-forth" teaching that happens with 20 stu-

dents in a room all working on the same project, he said.

The "materiality" of the class also is lacking.

"I can't show the students how to do something by drawing on their actual drawing," Russell said. "I can, of course, film a video, or digitally draw on their drawing photo. But this is not the same at all. And something is definitely lost in the process."

Clara Lieu, an adjunct instructor of art at Rhode Island School of Design, is teaching a figure-drawing course for illustration this semester. It is, of course, challenging, as there are no live models in the remote format and Lieu does Zoom calls with small groups of students, based on their availability. Some are as far away as Asia, so timing is a challenge.

"Online teaching is definitely more work than teaching in person," as it requires more mental effort and even more preparation, she said. "What I find is that in person, you can be way more flexible and spontaneous."

Still, Lieu knows that remote art instruction can be done. She's been teaching art online for several years at the website *Art Prof*. Critiques can be purchased, but instructional videos and tips on the site and YouTube are free.

Particularly relevant for COVID-19 is Lieu's video and lengthy post on five mistakes to avoid while teaching online. Lieu recommends putting yourself on video for your students, even if you're camera-shy, to build [presence](#). Set reminders and time-specific deadlines, use platforms your students already use (Lieu loves YouTube), offer students different modes of communication with you, and be flexible and accept substitutions. Lieu also advocated distilling the essential points of

Remotely Hands-On (cont.)

any lecture down to their essence. Online attention spans are low, she said.

Just as a science instructor can't teach a student to hold a micropipette online, Lieu said she can't teach students in a print-making class precisely how to hold their tools.

"'No, don't do it that way.' That's such a big part of teaching" that's harder now, Lieu half-joked.

Instructional videos generated as part of remote teaching do prove to be effective tutorials for students, however, Lieu said, especially in a field such as art, where students tend to be self-motivated. They spend many hours working on projects on their own time even in a typical semester, she said.

Andrew Schulz, dean of the University of Arizona's College of Fine Arts, said that "historically, the visual arts have been a solitary practice, so in some regard, it's easier to re-

produce this in a remote teaching context."

Echoing Lieu, however, Schulz said doing so becomes more difficult with advancing technology, such as laser cutting, "which is like lab equipment."

Exhibitions Canceled -- and What's Ahead

Schulz also said the arts are meant to be shared, in visual art shows, music and dance performances, and more. Arizona quickly moved to cancel all its in-person events due to COVID-19 but has since found ways to move some of them online, including the annual Bachelor of Fine Arts Exhibition.

Schulz said all the cancellations are hardest on students who are finishing their degrees, as seniors and graduate students "were looking forward to public presentation and capstone experiences."

Performance cancellations have affected many programs across in-

stitutions. Melissa Heller, costume shop manager and design instructor at Pacific University, for instance, said her class is typically "a lot of learn as you go during each of the productions." There is no show to work on this semester, of course, so Heller's one and only current student is writing a research paper on a topic of her choice. She'll submit it at the end of the term.

As in the sciences, accreditation by outside bodies is a reality for many arts programs. Schulz said accreditors have, by and large, been accommodating in these usual circumstances.

In addition to day-to-day adjustments, Schulz was already looking ahead, to how COVID-19 will impact arts education as a whole.

"Artists are resilient, innovative and imaginative, and we'll figure it out," he said. "It might look different than we're used to -- the whole landscape is going to look different." ■

[Read Original Article](#) ▶▶

<https://www.insidehighered.com/news/2020/04/14/teaching-lab-sciences-and-fine-arts-during-covid-19>

The Shift to Remote and What's Ahead for Fall: Your Turn

Readers share "feasible" ideas for a fall instructional model with students on campus but physically distancing. And the particular challenges this spring for instructors and students at institutions that use the quarter system rather than semesters.

By **Doug Lederman** // May 6, 2020

This week I turn my column largely over to you, faithful readers.

You're on the ground doing the good, hard work of teaching or caring for students or leading your departments or institutions.

So we take it seriously when you disagree with assertions we've made or have ideas to share that provide alternatives to ours.

Below you'll find several responses to articles "Transforming Teaching and Learning" has published in recent weeks, which I hope will inspire more discussion about how colleges, instructors and students should view what they've encountered this spring and what might lie ahead for the fall.

At the end of my column last week, I asked readers for their best thinking about what an "in-between" fall term -- neither fully virtual nor fully in person -- might look like. I admitted to struggling to see how colleges might provide instruction to some or all of their students

(especially undergraduates) if they were on campus but still required to physically distance (legally, because states demanded it, or ethically, because, well, it might be the wise, safe thing to do).

Several people responded to the query in my column and on Twitter, where I [posed a similar question](#). Comparable discussions have unfolded on the POD Network Listserv and elsewhere, frequently accompanied by doubts about the wisdom or viability of such arrangements. Some of them are related to educational issues such as the potential safety of faculty members (as my colleague Colleen Flaherty raised in [an excellent *Inside Higher Ed* article Monday](#)), but many are about the practicality of housing and feeding students in such an environment and of ensuring that hundreds or thousands of independent (often young) adults behave responsibly.

A couple typical comments along those lines:



SOURCE: ISTOCK.COM/TREETY

Not that doesn't radically increase faculty/staff load, work for students who live more than 50 miles from campus, or seriously jeopardize staff safety.



I am advising faculty to plan for two fall scenarios: 1. All-online, or 2. Starting on campus, moving to online under crisis conditions, just like this semester. Any attempt to create an "in-between" would result in scenario 2.



The Shift to Remote and What's Ahead for Fall: Your Turn (cont.)

The responses below focus just on the instructional piece of the puzzle. I offer them in the interest of sharing the wisdom and, I hope, spurring more discussion.

I can't say I come away any more persuaded than I was that most residential campuses can accommodate hundreds or thousands of students safely for all involved. But

it's clear faculty and academic staff members are thinking creatively about how they might serve students well if their campuses open and the situation requires them to.

I proposed to our school leadership team that we go to a split schedule on a daily basis starting in September -- half the school in the morning and half the school in the afternoon, which would limit each class size by 50 percent for physical distancing protocols. More work for the teachers and instructors in the short term, but they will all still have jobs. This would be accompanied by a dynamic and interactive remote learning platform to enhance student mastery. Any master timetabler worth her/his salt could easily draft up a timetable that works -- technology allows for such a wonderful outcome. Yes, a split schedule would make for long days for the faculty, but the long-term prospects of keeping students in school and a strong revenue stream far outweigh any short-term issues.

Phil Hill, Jeanette Wiseman and I recorded a podcast episode about fall planning called "Considering Hybrid (Flexible) Models":

<https://mindwires.com/episode-1-hybrid-flexible/>

-- Kevin Kelly, San Francisco State University

HyFlex offers some interesting possibilities. I've been reading up on it. <http://blogs.onlineeducation.touro.edu/what-is-a-hyflex-course/>

At my university there has been discussion of moving many classes to a hybrid in which teachers meet with students in person one day per week and have virtual class another day of the week. Very large lecture courses would move fully online, but many of the smaller classes would be able to meet and still maintain social distancing protocols. Since large lecture courses would be online, the spaces typically used by them would accommodate medium-sized classes so students could spread out. The move to hybrid classes would also stem the crush of students on campus as only about half of the normal classes would be meeting in person on a given day. Consideration is also being given to all on-campus resident students having their own single dorm room to promote social distancing. This obviously would not allow the typical number of students to reside on campus, but would allow some.

My latest idea to hold classes in a (somewhat) safe manner is an enrichment hybrid model (thanks to a colleague for helping provide a somewhat appropriate name for this). In this model, campus is opened, but didactic classes remain online and in-person enrichment activities (no new content) are offered by faculty during the scheduled class time and students are cohorted to provide for social distancing -- half the class can attend the enrichment activity on Tuesday and the other on Thursday, for example. Students that are high risk can solely participate online if that is their choice without additionally burdening the instructor, and it doesn't really single out faculty that may be high risk and would like to remain solely online. Should there be a second wave, classes would already be online, helping to maintain consistency for students. My concern "with the solution being meeting with half the class or a third of the class at per day of class" as originally posted is the additional work that this could pose on faculty as each course is essentially turned into two or three mini classes if 1) the class time is being used to share new content and 2) in order to meet contact hours there must be interactivity and instruction online anyways as they're only in their seat half or one-third of the time.

-- Katherine Fisne, Marywood University

In recent weeks, several readers have asserted that much of the news media coverage about the COVID-19-affected instruction this spring has focused on the many institutions that made a midsemester switch from in-person to remote classes.

That ignores, they point out rightfully, the not-insignificant number of colleges and universities that still operate on quarters instead of semesters, and the special problems they and their students and instructors faced.

Marilyn Edelstein, an associate professor of English at [Santa Clara University](#), described in an email how things have unfolded at her university, where the transition to virtual instruction happened not over spring break, in the middle of a term, but in the final days of a winter quarter and just before a brand-

new spring term began.

Most of the articles I have seen about the effects of the COVID-19 pandemic on higher education -- and especially on faculty and students -- have been based on what appears to be the default assumption that all U.S. colleges and universities are on the semester system. Perhaps this reflects a general East Coast bias in national discussions of higher education. But many colleges and universities -- especially here in California, including most of the University of California and California State University campuses but also many private institutions -- are not on the semester system but rather on the quarter system, which typically means there are three approximately 10-week-long quarters (plus summer sessions): fall, winter and spring. Thus, our experiences of reshaping our courses to be online-only have

been radically different.

At the private, Jesuit university where I have taught for many years, we were notified at 5:00 p.m. on Monday, March 9, that starting the next morning -- Tuesday, March 10 -- all of our classes would have to be moved online. We do not offer any online courses for undergraduates during the academic year, although we do offer some during the summer. So with about 15 hours' notice (or a bit more for those of us teaching later in the day on Tuesday or teaching on Wednesday), we had to jump into action to reconfigure our classes for what was actually just the final week of instruction to be online-only. For most of us, that meant trying to learn all we could in a day or less about how to teach online. For some of us, that meant relying heavily on Canvas discussions and email for the last week

The Shift to Remote and What's Ahead for Fall: Your Turn (cont.)

of our quarter. Most of us also had to redesign our final exams, scheduled during the week of March 16, to work online. For some faculty, that meant figuring out ways to proctor online exams, too.

On March 11, 2020, my county (Santa Clara County) became first in the country to issue shelter-in-place orders; my state, California, became the first state to issue these orders a few days later. So faculty and students suddenly had to deal with radical changes not only to our teaching and learning, but to life in general. Students suddenly had to move out of our residence halls during the last week of winter quarter, and faculty were supposed to stay off campus.

For faculty, the most critical difference between those of us teaching on quarters and those teaching on semesters was the need for us to plan our upcoming, starting-from-scratch spring quarter courses for remote instruction with a whole new set of students whom we would never even meet. And we have received often contradictory advice from administrators and technology folks (as well as from higher education articles and websites) about whether to make those courses fully asynchronous or synchronous, or a blend of both. For those who opted to take the dominant advice to do fully asynchronous courses, that would mean they would never even see their students during our current spring quarter -- which runs until mid-June.

And, although our academic technology, media services and faculty development staff were providing incredible amounts of support, for the vast majority of the faculty at my university who had never taught online before (and, in many cases, had never wanted to), including me, we have found it incredibly labor-intensive, time-consuming, stressful,



For faculty,
the most critical difference between those of us teaching on quarters and those teaching on semesters was the need for us to plan our upcoming, starting-from-scratch spring quarter courses for remote instruction with a whole new set of students whom we would never even meet.



frustrating and disconcerting to teach whole classes of students whom we will never meet or talk to in person, even if we opt to use Zoom or other videoconferencing tools for some of our class sessions or for office hours (as I am doing, blending synchronous and asynchronous teaching).

Those who teach on semesters -- many of which are ending soon -- were well into their spring semesters when all instruction was moved online. They had gotten to know their students fairly well by then and had met with students frequently inside and/or outside the classroom.

My university did decide to turn the first week and a half of our spring quarter into an "instructional preparation period," so faculty and students had about a week to learn how to teach and learn online. Our spring quarter classes formally began on April 8, so we are at about midquarter now. I have a class with 28 students, and for my once-a-week Zoom sessions, I can't even see all the students onscreen at the same time on Zoom (since the limit is 25 boxes per screen). My students have nev-

er met me, and I've never met them. Most but not all of my students join the weekly Zoom sessions, and I can see photos of all the students on my roster. But this teaching experience has been unlike any other I have had or would want to have. My university and our faculty value close personal attention to students and meaningful interactions between students and faculty both inside and outside the classroom. Most of our undergraduate classes are relatively small (with under 30 students), and many are primarily discussion-based.

Teaching a quarter-long course to a screen full of little boxes containing images of students I have never met is no substitute for teaching in person (and for understandable reasons, some students choose to participate on Zoom by audio only, so I and other faculty may never even see their faces). I have spent and continue to spend countless hours researching how best to teach online, attending technology and online teaching workshops, and communicating with our technology folks about using the various technologies available to us, and I'm do-

The Shift to Remote and What's Ahead for Fall: Your Turn (cont.)

ing this while I'm still only in the middle of a new quarter. Almost all our students went home in mid-March and are taking a full load of classes this spring with faculty they have never met and may never meet, in courses that began and are running online-only, and while dealing with new family, housing, financial,

technology and/or health challenges plus all the social and emotional challenges we all are facing during this pandemic.

Having half or a third of a semester moved online with little notice is very different from having an entire 10- to 11-week-long quarter moved to online-only from its start to its

finish with very little notice. Thousands of faculty and hundreds of thousands of students across the U.S. at quarter-system colleges and universities have had to deal with some overlapping but also some radically different challenges than those at semester-system colleges and universities. ■

Read Original Article ▶▶

<https://www.insidehighered.com/digital-learning/article/2020/05/06/instructors-describe-impact-shift-remote-colleges-quarter-system>

What Do We Know About This Spring's Remote Learning?

What should we try to find out? And how might what we learn influence how colleges educate their students this fall and beyond?

By **Doug Lederman** // June 10, 2020



SOURCE: ISTOCK.COM/RIDOFRAZ

This spring COVID-19 forced hundreds of thousands of college instructors and millions of students to take their teaching and learning into a virtual realm most of them had not chosen and with which many of them were unfamiliar.

So how'd it go?

First, it's important to say, it *went*. In other words, most faculty members made the switch adequately enough that most students were able to continue their educations rather than wash out. Given how consistently people love to say that higher education is stuck in its ways and can't adapt, that alone might be considered a minor mir-

acle. Professors adapted; colleges adapted. Most educations were not derailed.

Second, students and parents, as well as **college leaders** and **professors**, overwhelmingly believe that the learning experience was subpar. That would hardly be surprising, given the aforementioned lack of faculty and student experience and the fact that the pivot of in-person to remote teaching occurred with instructors having as little as a weekend and at most a week or 10 days to make the move.

It also recognizes that all parties involved have struggled through the last three months with varying degrees of personal and profes-

sional precariousness. Some have had trauma from coronavirus-related physical or mental health concerns or recession-driven economic woes.

But what do we really *know* about how it went?

Did less learning happen than it would have if students had remained in the physical classroom, as is widely asserted? Were students less engaged in their learning, and if so, was that because of more distractions in their lives or because the experience was less, well, engaging? Does the spring's experience give us meaningful insight into whether virtual forms of education can be effective?

What Do We Know About This Spring's Remote Learning? (cont.)

And perhaps more importantly: What should we seek to learn about how it went, through surveys, data analysis or other means? And how should what we glean inform how colleges and universities educate their students this fall and beyond, given the likelihood that technology-enabled learning will remain central to the higher ed landscape in the COVID-19 era, and probably beyond?

Many critiques of the education colleges provided this spring (including [one published elsewhere](#) on this site today) referred to the instruction students received as online learning, rather than as emergency remote instruction, which is more accurate. The distinction may seem like hairsplitting to some, but I agree with others who say it's not.

While "online learning" can mean many different things, it has been practiced for more than two decades by many thousands of educators who have built up a large body of expertise and evidence that, done right, it can be effective.

By and large, what happened this spring wasn't that: it was legions of dedicated instructors doing their best to figure out how to deliver courses they had built for a physical classroom to a group of now-dispersed students, using whatever technology and often rudimentary pedagogical practices they (with help from their colleges' instructional designers and faculty development staff members) could master in a matter of days.

Faculty members and students alike were not well suited to thrive in that environment. A majority of faculty members had never taught an online course before this spring, and many had not had any training or preparation beyond what institutions were able to give them over spring break.



If it's a synchronous class,
you've committed to showing up
at the same time each week and built time
into your schedule so you can dedicate your
attention and time to it.



In normal times, students who've chosen to study online "know what they're signing up for," says Natasha Jankowski, executive director of the National Institute for Learning Outcomes Assessment. "If it's a synchronous class, you've committed to showing up at the same time each week and built time into your schedule so you can dedicate your attention and time to it."

That wasn't the case for most students thrust into remote learning this spring. "There was no guarantee they'd be available at the same time," Jankowski says. "Whether it was watching their kids, or picking up some extra work hours to pay bills, or caring for a loved one, education just may not have been the priority on their survival scale."

Even a course designed to be asynchronous may not have worked as intended for some students, says Jankowski, who is also a research associate professor in the department of education policy, organization and leadership at the University of Illinois at Urbana-Champaign. "Requiring people to

create really cool videos of an oral presentation depends on people having good Wi-Fi access or technology," when some students' best Wi-Fi access was in a nearby parking lot. And many instructors put time limits on proctored exams, when there was "no guarantee I have three undisturbed hours in my house ... We went into protection mode, security mode, instead of thinking about how we enable learning in a global pandemic."

For that reason, says Jillian Kinzie, associate director of Indiana University's Center for Postsecondary Research, "now is not a time to be judging anything about our effectiveness with online learning" based on this spring's crisis transition. It's also not a time to judge individual professors' efficacy in teaching, which is why many colleges have decided [not to consider this spring's student evaluations of teaching](#) in future decisions about tenure and promotion.

But just because it's unwise to judge the quality or potential of online learning by the rushed version of it most students encountered this spring doesn't mean we can't

What Do We Know About This Spring's Remote Learning? (cont.)

learn from the just-completed term, says Kinzie, whose Indiana center is home to the National Survey of Student Engagement, which gauges the perceptions of four-year-college students.

Early results from administrations of NSSE this spring show that next fall's incoming freshmen -- having had more experience with virtual learning than they otherwise would have had -- "realize how self-directed they need to be" to thrive in that setting, she says. "That's not a bad outcome from a slapdash approach to online instruction in K-12."

Those students "also have been tasked with inventorying their own capacity -- everything from software and hardware to their attention and personal capacities," Kinzie says. "How long can I sit and do this -- what's my attention span? Do I know how to access resources if I'm in a solely online experience? They've had to ask themselves all these questions."

Colleges should tap in to that as they consider how their own students fared this spring, Kinzie says. "Institutions could ask students to really inventory their skills, what they learned about themselves as learners, try to capture some of that," she says. "They could identify if a student had trouble paying attention because her house was noisy, because little brothers and sisters were bugging them so they couldn't get things done. Whether

a student was able to find relevant resources when they couldn't walk to talk to a librarian or nudge a classmate in the next row. That is all valuable information for institutions and for individual learners."

To the widespread assertion that students "learned less" this spring, Kinzie asks a metaphorical "how would we know?"

"The professor's answers shouldn't be, because students scored lower on the final exam I produced for them that was the same exam I've been delivering for 30 years," she says. "There are just too many factors that could affect that -- taking on more hours at the local grocery store [to make up for a lost on-campus work-study job], caring for dependents."

"This semester has asterisks all the way down the list," Jankowski agrees. "Add the words 'in a global pandemic' to any question you might ask."

Kinzie hopes institutions will try to build off some of the creative new approaches to assessing student learning that emerged as professors had to experiment. "I know faculty who were really surprised, pleasantly surprised, by what students were able to produce in difficult circumstances because they still wanted to get something out of it," she says. "Let's look at what we did to allow students to demonstrate their learning in new ways, or more crafted by the connections they made with the content than

the ones we were forcing them to demonstrate.

"Let's surface examples from faculty who had to resort to different forms of having students demonstrate a particular learning outcome, to show that students can be responsive when they're given a little freedom," she adds. "In the end, this could really help shift and reorient assessment practice to be much more about what the student is owning in the experience, rather than responding to the standard ways of expressing their learning."

Elsewhere on the Indiana University campus, Ben Motz, a research scientist in its department of psychological and brain sciences, is also on a quest to learn about this spring's learning.

As director of the university's e-learning research and practice lab, Motz is principal investigator on a new ["Mega-Study of COVID-19 Impact in Higher Education."](#) In conjunction with researchers at Ohio State University, Motz and his peers are surveying faculty members and students and analyzing learning analytics data from institutions in the Unizin Consortium of research universities with a goal described this way:

"There's a great deal of hunger for evidence of what the problems were so we can at least do due diligence of how we can fix them for the fall," Motz says. While many students and parents may have

As our full nation's instructional faculty are suddenly forced to explore the contemporary online learning toolkit, and students are assigned to learn from whatever faculty cobble together, we have the obligation to understand the gaps that they discover, and how this impact is felt.



What Do We Know About This Spring's Remote Learning? (cont.)

bemoaned the quality of the learning experience this spring, most also understand the crisis conditions under which it occurred. The expectations for virtual learning this fall will be higher, Motz says.

"It's as if faculty got a 'You pass Go and collect \$200' card," he says, a Monopoly reference that might be lost on many of today's students. "The likelihood we'll get another favorable draw out of the community chest is low."

The study's goal is not to "evaluate online learning," Motz says, because "a large majority of faculty members and students didn't know what they were doing."

But the existence of a "field test" in which "100 percent of the target population" of students and faculty members "give it all a shot" created what Motz calls a "massive user study" both of the technology instructors and students used and the educational practices they employed.

On the technology side, it will be instructive to see how professors used various tools and how quickly they were able to adapt how they used them. "It almost doesn't matter whether a professor gets it right on the first try," Motz says of an instructor's interaction with a learning management system or videoconferencing platform or other technology. "Technology development is more of a sociological problem than a good use problem. If it takes you two years to become a power user [of a piece of technology], your product is broken."

Much more important is what researchers can glean about professors' interactions with students, and students' with course material and each other, Motz says.

While data from the faculty and student surveys are still being processed, very preliminary results re-



It's as if faculty got a 'You pass Go and collect \$200' card.... The likelihood we'll get another favorable draw out of the community chest is low.



veal that students spent much of their time this spring reading textbooks and watching videos of instructors "giving the lecture he would otherwise have given," says Motz.

"It was spectacularly isolating," he adds. "The thing that was totally forgotten in this is any kind of contact among students or between students and faculty members. The faculty member seemed to feel the need to be a firehose of knowledge. The street was one way."

It isn't surprising that in the rush to transform courses in a hurry for a different mode of delivery that "the common response was to ignore those more interactive aspects of what online learning could be -- they just needed to survive," says Motz.

The good news about that is that's a fixable problem; for courses that remain virtual this fall (or that build virtual components into a hybrid model, as many institutions are considering), faculty members have more time to build in community-building elements that will make for a more engaging learning experience.

One other preliminary finding from the Unizin study suggests that instructors are game to try to improve their virtual teaching. Students who've responded to the survey say they are less likely to take online courses in the future, based on their experience this spring. But faculty members? "They're much more willing to teach online courses after the spring," Motz reports.

Jankowski of NILOA sees several key takeaways from the spring that she hopes will influence the faculty's approach to learning going forward.

First, early results of the association's [own survey](#) of assessment-related changes this spring shows that many instructors did not put student needs or issues of equity into account in their rush to transform their face-to-face courses for remote instruction. "A lot of people made quick decisions, then later asked, 'Did that work for you?'"

Very quickly, though, the diversity in students' needs and situations became "starkly raised" for instructors, Jankowski says. In normal times on a campus, students turn

What Do We Know About This Spring's Remote Learning? (cont.)

to various student affairs offices to deal with problems or difficult situations.

But in the pivot to remote learning, "the main touch point that students had with the institution was with faculty, and they were getting bombarded with questions about mental health, medical things." On campus, a professor might have referred a student to student affairs, says Jankowski, but with urgent requests, many instructors "ended up having to get support from student affairs professionals for what they do holistically for students."

"I'd like to think professors came away from this spring with a better understanding of the whole student -- not just for the time they show up in my class, but the fact that they have layers of things that are going on. They're not just a student, but a caregiver, or a foster youth ... I would like to see us not be surprised about our students."

Jankowski also, unsurprisingly, sees opportunity for instructors to emerge from their experience this spring with a heightened sense of the importance of how they assess students' learning.

She says her anecdotal sense is that faculty members who had built their in-person courses very specifically around a set of learning outcomes "understood the value of that when they made the pivot" to remote learning, when many of them reconsidered their expectations for the amount of work students could do given everything else they were juggling.

"It gave them an ability to home in on the most important learning for the end of that term," Jankowski says. As professors considered what assignments to keep and which to ditch, those with a clear sense of the course's goals had an easier time deciding "what do I need to have my students focus on, what are the most important parts of what students need to learn."

"One question for future is whether the importance of learning outcomes and assessment as a design tool carries over and permeates how we build courses," she adds.

Jankowski says she saw professors adapt in another way that heartens her -- by shaping their assignments in response to what students were encountering day to

day.

A math professor who asked students to graph their internet speed over time, to gauge how it might affect their learning. A history instructor who incorporated the 1918 flu into the course plan. Psychology faculty members who asked students to watch a movie with the family members they were holed up with to understand the differing prisms through which they viewed it.

To the widespread assumption that students learned less during this time, Jankowski acknowledges that that's a possibility. But maybe it was just a different kind of learning, she says -- "maybe it became more poignant because it was relevant to how I was living."

She cites another example of music students who used video platforms like YouTube or Flipgrid for group recitals. "That wasn't the faculty that figured it out -- it was the students. It could benefit us to keep in mind that they can be co-creators, and they might have really good ideas if we make clear the outcomes we're trying to get to." ■

[Read Original Article](#) ▶▶

<https://www.insidehighered.com/digital-learning/article/2020/06/10/what-do-we-know-and-what-should-we-try-learn-about-springs>

OPINION

A Day in the Life of a Remote Instructor: Fall 2020

I Jenae Cohn envisions how the term may unfold for a faculty member who remains off campus in September.

By Jenae Cohn // June 24, 2020



SOURCE: ISTOCK.COM/SVETIKD

You pour your second cup of coffee for the morning and get ready to hop online to teach. You have a designated work corner in your home space that you gradually shaped to suit your needs after a tumultuous spring term where you were launched unexpectedly into remote teaching. You brought your office chair home, bought an external keyboard and laptop riser online, and you've decorated your space with a few of your favorite photos.

You still miss the feeling of going to campus, walking through the quad on the way to your department building, but you're getting used to this setup and you're grateful that you don't have to wear a mask all

day or worry about touching the same doorknobs as hundreds of other people.

You open your laptop and find three new Slack notifications waiting for you. This is the first time you've ever used Slack, a messaging tool you've installed on your desktop, but you're liking it so far. It's a bit faster to communicate with people and more dynamic than email. One notification is a direct message from a student asking if they can make an appointment with you to talk about their latest assignment. One is from your class's workspace; you see that one of your students responded to the prompt you posted yesterday inviting stu-

dents to share study tips for the upcoming exam (to your delight, they included a GIF of a cat with a book open).

The third notification is from another instructor in your department, posting a link to the latest *Inside Higher Ed* article about online teaching to your department's workspace channel. You respond to your students, browse the article and add a thumbs-up reaction emoji to your student's study tip idea.

You then open a browser window and log in to your campus learning management system. You open up an assignment that your students submitted yesterday and start to read the responses, taking note of

the most thought-provoking one that you intend to shout out during your upcoming Zoom class session. Some of the student responses are written; others are submitted in the form of voice memos.

You broadened how students submitted informal, small assignments to your class this term, and you've enjoyed seeing the range. In addition to allowing students to send responses in the form of voice memos or written text, they can also submit notes or responses in the form of a drawing (many students take pictures with their phones) or digital sticky note brainstorming (the ed-tech specialist at your school gave you a few tools you could share with your students to help them accomplish this). You don't respond to each and every submission, but you peruse what's there, noting trends among your student responses, even as they span different media and forms. These low-stakes responses help you to take the temperature on your students' understanding of the course content.

Some days, this process feels harder than others, but you can't remember the last time you had such a clear sense of how your students understand the course content. That's been helpful for you in terms of prioritizing where to spend your time in terms of recording new mini lectures and posting course materials. At first, you thought you'd record lectures for everything you think is relevant to the course (a task you soon realized was overwhelmingly time-consuming), but now you've started to shape what you say in prerecorded mini lectures based on what you're hearing and seeing from your students.

In fact, you've really decided to cut back on your Zooming this fall term because you got so burned out



In addition to allowing students to send responses in the form of voice memos or written text, they can also submit notes or responses in the form of a drawing (many students take pictures with their phones) or digital sticky note brainstorming (the ed-tech specialist at your school gave you a few tools you could share with your students to help them accomplish this).



on video calls last spring. Instead of using Zoom time for lectures, you now use the time to synthesize the work that students submitted asynchronously, commenting on their ideas and inviting students to build upon their peers' contribution as a way to leverage the real-time interactions.

You've given them a variety of materials to peruse when they're not in Zoom, in fact: reading, using a social annotation tool to leave comments and ask questions about course readings, taking diagnostic quizzes, and writing reflective response essays where they can synthesize and analyze findings from the content they've watched and read.

It's super different from anything you've done before, and you've fumbled through it a lot. During the first week of the quarter, you forgot to publish the course resources in the learning management system, so you got a flurry of panicked emails from students. Those mistakes still don't feel great, but you're getting used to offering a quick apology, troubleshooting on the fly and then

moving along.

After reading the students' responses and taking note of the provocations that you think will foster some good real-time dialogue before you hop on Zoom, you comb your hair, turn the lamp on at your desk and start your Zoom class meeting. When you first began teaching remotely, you felt nervous about how you looked and spoke on camera, but as time has gone on, you've become a lot more relaxed. You've come to realize that your students don't really care that much what you look like. They're mostly happy just to get to interact with each other and see some of their peers online.

You see that your first student has entered the room, and the two of you chat informally for a bit while other students start to trickle in. Some students mute their mikes right away; others leave them on. Some decide to turn their video cameras on; others choose not to.

You used to ask everyone to keep their cameras on while in Zoom, but after reading some spirited editorials from undergraduate students in

A Day in the Life of a Remote Instructor: Fall 2020 (cont.)

the spring, you changed your policy and told students that camera use is optional. You realized that requiring students to have their faces present on camera wasn't really necessary for fostering dialogue and had the unintended consequence of making some students feel deeply uncomfortable and unsafe.

You've been relieved to see that the students who keep their cameras off aren't necessarily less engaged; they often contribute to the chat room in Zoom, and you see them sharing ideas in your class workspace Slack channel. Some students still don't seem as present as you'd like, but this was true even in an in-person environment. After all, even in a fully in-person environment, not everyone could be engaged 100 percent of the time. Plus, you're understanding that times are still especially hard right now and you're willing to give everyone the benefit of the doubt.

Your cat hops up on to your desk, and as you start to shoo the cat away, you see some of your students laugh. One types into the chat, "Hi, Frances!" Everyone knows your cat's name now; in fact, they know your whole family, as your 9-year-old daughter often wanders into the frame and they spotted your part-

ner in running shorts and sneakers about to go take a jog outside.

You've gotten to know some of their families, too. One of your students brought her younger brother in to say hi and perform a short TikTok dance during a break while another of your students' parents comes into the frame every so often to bring in a snack or a drink (much to the student's embarrassment). Some students are still living in the dorms on campus, so they often show off their posters and decorations there. You don't have a window into everyone's lives -- and it's your students' choices about how much they want to disclose -- but you feel like you're even getting to know them a little bit more as full people this term than when you're on campus.

You decide to start the live class session, emphasizing how impressed you were with what they submitted as part of their asynchronous work. You engage in a brief group share of the responses you enjoyed reading, and then you give the students a poll to check in on their understanding of another concept that came up in their asynchronous work. You use the results to have yet another group conversation, happening both verbally and in the chat.

The time in the Zoom session flies by as you're toggling between what feels like hundreds of tabs: you've got up your notes, your presentation slides, a browser with the learning management system, your Slack channel window and a running Google document with the collaborative class notes that students are taking. It's all a bit overwhelming -- and you sometimes share the wrong thing on your screen -- but your students have been patient and forgiving. Plus, the students spend much of the time in Zoom in small group breakout rooms working on something together, anyway.

Before you know it, you've logged out of Zoom and your little home-office corner is quiet again. You take a stretch break (you've been living in yoga pants since shelter in place began) and hop back online to get back to some of your own research and writing, accessing your library's virtual proxy network to access some new articles you need to read.

You'll be happy when it's safe to return to campus. You still miss the energy of a face-to-face class and being able to read an in-person room. But you've been pleasantly surprised; this was better than you expected it to be. You're all doing the best you can. ■

Bio

Jenae Cohn is an academic technology specialist at Stanford University.

[Read Original Article](#) ▶▶

<https://www.insidehighered.com/digital-learning/views/2020/06/24/day-life-remote-instructor-fall-opinion>

Not All Online Experiences Are Equal

Rob Weir gives advice for rethinking online education as no longer an emergency exception but what may be the norm in coming months.

By Rob Weir // July 8, 2020

It was a strange spring semester across North American college campuses. Professors who once vowed they'd take up sheep herding rather than teach an online class suddenly found themselves lecturing to a video camera and setting up virtual discussion groups. Several colleagues have been surprised by the ease of transitioning to a distance-learning environment. There have been glitches, and more needs to be done to serve communities still on the fringes of the digital revolution, but for the most part, the academy can take pride in its response to teaching in the age of COVID-19.

Some professors new to distance learning have had such positive experiences that they are interested in teaching an online course already in the course catalog -- perhaps even a continuing-education offering. And even those professors for whom Zoom is truly a four-letter word must prepare to gird their loins, as theirs may be among the institutions that have decided it's unsafe to reopen to residential students in the fall.

No matter which camp you're in, novices need to know that not all online experiences are the same. As heroic as efforts have been this spring, a month of online teaching is not equivalent to what you'll experience over 13 weeks. Before the campus shutdown, your course was already in motion. You'd gotten to know your students, imparted your expectations and developed mutual dynamics. When COVID hit, you also shared with students a sense of de-

termination to make the best of an extraordinary situation.

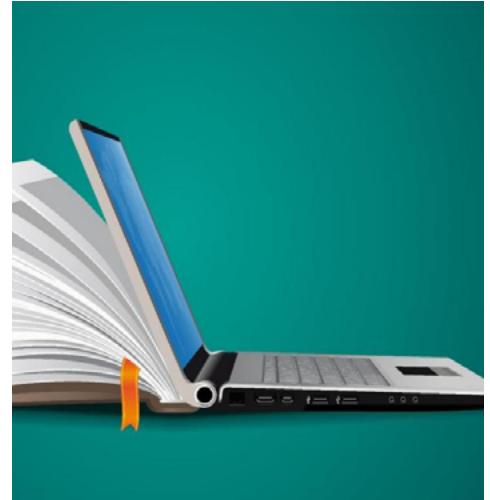
In this essay, I'll focus on how you need to rethink online education as no longer an emergency exception but what may be the norm for you in the coming months. (Experienced online instructors can start skimming now. My remarks are aimed at those who have yet to teach a semester-long virtual learning course.)

Recommendations for the Fall

Some of you will say that you can and should recreate online the experience students would have in a live classroom. That's not impossible, but experience makes me skeptical of such a claim. It is best to think of an online course as a different way of teaching. Not better, not worse -- just different.

For one thing, rapport is harder to build. It occurs in some of the same ways it happened this spring -- breakout discussion groups, virtual office hours, tutorial sessions and so forth -- but it doesn't happen as fast as it does live. Nor will all students react with the same sense of urgency or practice the same study habits in an online course.

Despite what overzealous futurists assert, as a recent [Brookings Institute](#) study indicates, online education is not for everyone. I find that older students frequently outshine younger ones, and for reasons not necessarily related to intellectual capacity. They are simply more disciplined and do not view the course as something they can dip in and out of whenever they feel so inclined.



SOURCE: ISTOCK.COM/JACEK KITA

Here are my key recommendations for how to think about online education this coming semester.

Establish hard and fast expectations. The last time I did an online course, I made a video of requirements and evaluative metrics. Students had to sign (digitally) a statement that they viewed it and agreed to the terms. (That didn't stop several from complaining that the writing requirements for my history course were too rigorous. But they had no leg upon which to stand, given that it was both a stated and posted standard.)

Professors have different approaches, but I'd caution against all of the following: extensions, retests, reopening threads or allowing laggards to make up work. If part of your grade involves participation, do not be suckered by those who claim shyness; if anything, I find that shy students are more voluble online. Make sure you establish the posi-

Not All Online Experiences Are Equal (cont.)

tion that now means now insofar as assignments and participation (including labs) are concerned.

Leniency was the watchword last spring, but in my view it's bad practice for *any* semester-long course. Once you open the door to exceptions, it is hard to close it. Unless a student procures a medical excuse or a dean's directive, stick to your published standards. As reported in *Inside Higher Ed*, online education often has a negative effect on future student GPAs and retention. We do students no favors when we look the other way at poor time management skills just because the course is online.

Think asynchronously. Logistics can be challenging. Synchronous teaching can still occur, but don't assume or overdo it. In many cases, online courses attract students that are more heterogeneous in demographics and circumstances. More adult learners, parents balancing academics and childcare, and those with tight job schedules often participate, as well as the occasional student from afar who is not enrolled in your institution. Students may be spread across time zones, especially if you have international students.

One of my best online students researched inside a Costa Rican rainforest and hiked into a town with internet service once a week to do his work. And as some of you have probably already discovered, some home-based students are forced to share computers, and night owls do their best work in the wee hours of the morning. In other words, unless your student body is hermetically sealed, asynchronous classes are best in most situations.

Get technical. The spring of 2020 involved a distinct coming together of campus domains: everyone used the same software and course-support platform, and IT professionals were given marching orders to make instructional assistance a top priority. Semester-long courses also have IT support, but don't expect priority treatment once other university offices come back up to speed -- responses will be more akin to pre-COVID levels. If you are considering a continuing-ed course, you should check which software and platforms are used, as they're often different from what the rest of the institution uses.

Nobody wants another thing to do, but if you're relatively new to online teaching, schedule a session with your IT department that is dedicated to a deeper understanding of how your course platform works and how you can fix common things that go wrong (out-of-sync audio, improperly sized images, broken links, etc.). Do this ASAP, so you can test-drive the platform well in advance.

Reimagine your role. Have you been posting 50-plus-minute lectures? The standard for a single video lecture is actually around 10 to 15 minutes! You can post more than one per week, but videos need to be short or they won't be viewed. Like it or not, many students will turn to their smartphones, so it's best to keep lectures succinct and place supporting materials in separate files on the course website.

In most cases, successful online instructors act as coaches, not experts in charge. Lectures should convey absolutely essential concepts, and the bulk of the course

should be experiential tasks ranging from discussion questions to hands-on exercises that direct students to application and self-discovery. (Yes, this is often less content-oriented.) Even better, allow students to learn from each other.

As a coach, be involved in classroom discussions but not over-involved. Log in to bulletin board threads early and often, and practice the art of redirection. Pose new questions, task students with helping each other unravel conundrums and solicit ways to reconceptualize problems. Students will sometimes post things that are flat-out wrong, but hold the "reveal" as long as you can. Think of yourself as a compiler, summarizer and final arbiter.

Set dates when comments will close. I seldom leave a thread open longer than a week and a half lest the bulletin board become un-navigable. After the cutoff, students can still read what has been said, but there is little point to new comments when the rest of the class has moved on. If an individual's participation grade suffers from falling behind, so be it. Isn't that also the case in a live classroom?

My apologies to those who already practice much of what I've just said, especially veterans of flipped classrooms. And to those new to online teaching, please don't let my remarks dim your enthusiasm. After all, even the most experienced hands were once where you are now. Remote learning is often exciting and rewarding. It also shares at least one trait with classroom instruction: the first time through a course has rough patches, the second time addresses those and the third time is the charm. ■

Bio

Rob Weir retired from teaching at the University of Massachusetts at Amherst and continues teach online classes.

[Read Original Article](#) ▶▶

<https://www.insidehighered.com/advice/2020/07/08/advice-rethinking-online-education-no-longer-emergency-exception-what-may-be-norm>

Inside Higher Ed

1150 Connecticut Avenue NW
Suite 400
Washington, DC 20036

Image Sources By
istock.com