COVID and Higher Education

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1 Introduction

The COVID-19 pandemic suddenly and drastically affected many aspects of life, including higher education. At the beginning of the pandemic, the nearly instantaneous transition to online education disrupted the way courses were traditionally taught. In the summer of 2020, colleges scrambled to decide on the best way to hold classes in the fall; many ultimately chose to remain online, while others opened in-person, and yet others chose some hybrid of the two.[1] Once classes did return in-person, colleges faced another challenge – determining the best testing, masking, and distancing policies. And when vaccines become available in 2021, college administrators had to make yet another set of difficult decisions about vaccine mandates and incentives. Throughout this period, many colleges struggled with reduced revenues, declining enrollment, and increasing costs associated with new technology and health needs.

Meanwhile, students, faculty, and staff were met with their own challenges. For students, changes in instruction modes, housing, and financial situations negatively affected study habits, academic performance, and persistence in college, particularly for disadvantaged groups. Overall higher education enrollment in the U.S. also declined in fall 2020 and fall 2021. In addition to these negative academic outcomes, the pandemic also increased health concerns and feelings of isolation among college students, contributing to worse mental health outcomes. As for faculty, they felt the immediate impact of switching instruction mode mid-semester as they quickly prepared new course materials and learned new technologies. Many faculty members, particularly women and those with young children, also experienced disruptions to their research agendas. Later, as colleges transitioned back to in-person learning, faculty, and staff voiced concerns about campus-based transmission of the virus, along with stress and burnout from increased pandemic-era teaching and service workloads.

This article summarizes some of the important lessons learned from research on colleges, students, and faculty during the COVID-19 pandemic. We highlight the following **key findings:**

- While nearly all colleges pivoted to online instruction in spring 2020, COVID-19 responses varied substantially across colleges during the 2020-2021 and 2021-2022 academic years.
- Colleges' COVID-19 health policies impacted both student and community health outcomes.
- COVID-19 negatively affected enrollment, grades, and other academic outcomes, with heterogeneity by student demographics and college characteristics.
- COVID-19 created new and exacerbated existing financial challenges for both colleges and students.
- COVID-19 necessitated innovation in learning technologies, admissions processes, and other areas of campus life that may have long-lasting effects post-pandemic.

While significant progress has been made in understanding the immediate impacts of the

pandemic, there remain many unanswered questions regarding its long-term effects on higher education. We aim to highlight these open research questions throughout the article.

2 Colleges' COVID-19 Health Policies

2.1 Pandemic Onset & Spring 2020 Policies

In the United States, concern over the spread of the COVID-19 virus rapidly intensified by the middle of March 2020. The World Health Organization (WHO) declared COVID-19 to be a pandemic on March 11, 2020, and President Trump declared a national emergency on March 13, 2020.[2] By this time, several colleges had already transitioned to online formats for meetings and classes, with Stanford University and Bellevue College among the first to do so. According to data collected by the College Crisis Initiative (C2i) at Davison College, more than 1,500 institutions had transitioned to online instruction by the end of March 2020. Remarkably, 90% did so before the first statewide stay-at-home order, demonstrating the quick responsiveness of colleges during this time.[3]

Actions to limit travel to and from college campuses during this early phase of the pandemic likely reduced the spread of COVID-19. Two important studies support this conclusion. One uses variation in colleges' spring break dates, determined prior to the start of the pandemic, to show that travel to and from college during this period led to increased COVID-19 spread.[4] Colleges with early spring breaks had these breaks as scheduled and brought students back to campus before instruction was moved online due to the pandemic. Colleges with later spring breaks switched to remote instruction during (or even prior to) the scheduled spring break, meaning that students never returned to campus following spring break. Counties with colleges that had early spring break had higher COVID-19 case rates by the end of April, compared to colleges with later spring breaks. Another study finds that colleges that hosted large sporting events in March 2020 saw increased spread of the virus and more COVID-19 deaths in their counties.[5]

2.2 2020-2021 Decisions & Policies

While nearly all U.S. colleges and universities conducted the remainder of the spring 2020 semester online, by the fall of 2020, colleges varied in choice of instruction mode (in-person, online, or hybrid). Most colleges maintained some degree of online instruction, with only 24% of colleges beginning the fall 2020 term "primarily" or "fully" in-person.[6] Data from the U.S. Department of Education's National Center for Education Statistics (NCES) further shows that most college students were engaging in some form of online or distance education in the first full pandemic academic year: approximately 75% of undergraduates were enrolled in some form of distance education in the 2020-2021 academic year, compared to only about 35% of undergraduates in the 2018 and 2019 academic years (see Panel A of Figure 1).

However, while most colleges maintained some online instruction in fall 2021, reopening decisions varied across institution types: 34% of private 4-years and 27% of public 4-years, compared to 13% of public 2-years reopened in-person. Similarly, 33.7% of undergraduate

students at private four-years and 44.3% of students at public four-years were exclusively enrolled in distance education courses, while 47.7% of students at community colleges were (see Panel B of Figure 1). Moreover, colleges that did choose to re-open in person pursued a variety of pharmaceutical interventions (NPIs), such as capacity restrictions, testing and isolation policies, mask mandates, and changes to spring break calendars, although most did not implement the full set of recommendations from the CDC.[7]

Research has examined how a variety of factors influenced colleges' decisions around instruction mode in fall 2020, finding that political and financial factors,[8] peer decisions,[9] state higher education governance structure,[10] and international enrollment (for private universities)[11] all played a role. In-person re-openings have been linked to the spread of COVID-19 during fall 2020,[12] and medical research has demonstrated a genetic link between campus outbreaks and deaths in the local elderly population.[13] At the same time, research suggests that on-campus testing protocols reduced cases and deaths.[14] However, mask mandates are thought to have been relatively ineffective in the higher education environment because students may not have adhered to them off-campus.[15]

2.3 2021-2022 Decisions & Policies

By the 2021-2022 academic year, colleges had largely returned to offering in-person classes, although 28.2% of students – approximately 20% in the four-year sector and 41% in the public two-year sector – still exclusively enrolled in distance education, taking no in-person classes. However, while most colleges had returned to in-person classes, they varied widely in their vaccination, masking, and testing policies. Vaccinations for COVID-19 became widely available to college students by the summer of 2021, and vaccination policy quickly became one of the most controversial public health issues surrounding COVID-19. Nearly 700 postsecondary institutions implemented vaccine mandates for their students for the fall 2021 semester[16] with highly selective universities and liberal arts colleges most likely to implement a mandate.[17] Just as with the reopening decisions in fall 2020, political factors[18] and peer decisions[19] influenced colleges' decisions to implement vaccination mandates. Research demonstrates that the vaccine mandates increased vaccine take-up and reduced cases and deaths in local communities,[20] and were generally popular with students.[21]

2.4 2022-2023 & Beyond

By the start of the 2022-2023 academic year, and particularly by the start of the 2023-2024 academic years, colleges had largely rescinded mandatory COVID-19 vaccination, testing, and masking policies. In fact, by the start of June of 2023, only 7.4% of colleges reported requiring COVID-19 vaccines for all students.[22] These shifts in campus policies largely reflected changes in COVID-19 health concerns and policies nationally. For example, state-level emergency health orders generally expired between the spring of 2021 and the spring of 2023.[23] Yet, ongoing discussion continued over the benefits and costs of certain academic policies implemented during the pandemic, including online learning and the use of standardized testing in admissions. We turn to the academic effects of the pandemic and pandemic-related policies in the next section.

3 Academic Challenges During COVID-19

The pandemic and subsequent shift to remote learning in spring 2020 represented a large disruption to students' lives. According to survey data from the NCES, 87% of college students experienced some change in enrollment or instructional delivery mode, 39.6% experienced a financial disruption or change (e.g., lost job/income), and 27.5% experienced a housing disruption or change (e.g., moved back to permanent address) during spring 2020.[24] These varying disruptions led students to reduce study time, withdraw from courses, delay graduation, and/or leave higher education entirely,[25] with effects especially large for disadvantaged students.[26] Below, we review the literature on how these disruptions and associated policies affected student outcomes across the higher education landscape.

3.1 Remote Learning

A number of studies have demonstrated negative effects of remote instruction during the COVID-19 pandemic. In one study using data from seven intermediate microeconomics courses at four R1 research universities, researchers found that Spring 2020 course performance declined by 0.2 standard deviations (sd) on average compared to the Fall and Spring 2019 semesters.[27] Another study using data from Virginia community colleges showed that the switch to remote learning in Spring 2020 had negative effects compared to beginning the semester online.[28] Yet another study using data from a single R1 research university shows that the negative effect of online course format continues through Spring 2022, although the difference has lessened following the pandemic.[29]

Some of the most convincing evidence regarding online learning in the pandemic context comes from the US Military Academy at West Point, where students were randomly assigned to online introductory economics courses in fall 2020. Exploiting the random assignment, researchers found that students assigned to online courses saw reduced grades, with an effect size of 0.22sd.[30] However, evidence from an RCT conducted in Germany suggests that tutoring could help offset some of the negative effects of online learning.[31] Finally, while there is substantial evidence of the negative effects of online learning during the pandemic generally, there is less work on the academic impact of contracting COVID-19 itself. One study using administrative data from a single public university in the US finds that a COVID-19 absence reduced the affected student's semester GPA by 0.08, though the same study finds that online modality mitigated this effect.[32]

Given the importance of online learning in the early pandemic period, there was some concern about accessibility for students who might not have access to the necessary technology. This was a major concern in K-12 education, and some evidence suggests that it also affected college students. For example, in one survey conducted in two professors' classes at their four-year private colleges, approximately half of the students had at least occasional internet problems,[33] which could contribute to the negative effects of online learning documented in the literature.

The move to online learning also generated concerns about maintaining academic integrity. With online exams came increased opportunities for students to use non-approved testing

resources, like textbooks, the internet, or even other people to help complete exams and assignments. One study from a large public university detected cheating on online exams using timestamp data from an online course management system and argues that camera proctoring is one of the best ways to curtail the issue.[34] Their conclusion is backed up by evidence from a research university in the Netherlands that suggests that camera proctoring is an effective cheating deterrent.[35] Two additional studies provide further evidence suggesting that cheating on unproctored exams is quite prevalent, but that techniques such as live or online proctoring and the use of new exam questions (vs. exam questions available online) can largely mitigate cheating.[36]

3.2 Grading Standards & Options

Recognizing that COVID-19 introduced new challenges for students and faculty alike, many colleges changed their grading standards and grading options for students. A common approach was to adopt some form of a flexible grading policy, often allowing students the option to take certain courses on a pass-fail basis, or even retroactively opt-in to a pass/fail grade or withdraw from courses after the conclusion of the semester. [37] Many advocated for these policies as a way to support students during a challenging time, but others were concerned about their potential long-run effects, including on students' preparation for follow-on courses, transfer and graduate school admissions, and labor market outcomes.

While these potential long-run effects have yet to be rigorously established, researchers have begun to document how flexible grading policies were used by students, as well as how their use correlates with medium-run outcomes. One study examines patterns of pass/fail option take-up at a medium-sized U.S. university, documenting that the pass/fail option was more likely to be used by lower class level students (e.g., freshmen, sophomores) and in STEM and economics courses.[38] They further find that some students' progress may have been negatively affected by taking early courses in a sequence on a pass/fail basis, because they may not have been fully prepared for subsequent courses. Another study shows that women are substantially less likely than men to choose to conceal grades that would harm their GPAs, which could generate gender disparities in educational and labor market outcomes in the coming years.[39]

Two additional studies examine changes in students' GPAs during the COVID-19 pandemic, which may have been influenced by flexible grading options. One uses data from the College of Agriculture at Texas A&M University and demonstrates that average GPAs increased by 0.22 points in Spring 2020 and 0.18 points in the next two semesters.[40] They are unable to examine each potential explanation in insolation, but posit that university-level grade policy changes, cheating in online examinations, and/or reduced expectations on the part of individual professors may have played a role in these grade increases. Another study finds that flexible grading policies were most beneficial for the GPAs of low-income and low-performing students (as judged by pre-COVID performance).[41]

3.3 Admissions Policies

Similar to flexible grading policies, flexible admissions policies were yet another way in which colleges aimed to accommodate students' varied academic challenges during the pandemic, including reduced access to standardized testing opportunities. In particular, test-optional policies, which allow prospective students to apply without submitting SAT or ACT test scores, were widely adopted during the pandemic period. The number of colleges with test-optional policies approximately doubled between spring and fall 2020, with more public and racially diverse institutions adopting a policy that had previously been dominated by small, selective liberal arts colleges.[42] It appears that students respond to these policy changes as the share of students submitting standardized test scores on the CommonApp platform fell from 75% in fall 2019 to 37% in fall 2020.[43] Students also behaved strategically in response to these policies, withholding lower scores and disclosing higher scores, and being more likely to withhold scores when colleges' test policy language indicated they were not an important factor in admissions decisions.[44]

To date, there is relatively little research about the effects of these pandemic-era test-optional admissions policies on admissions outcomes, enrollment decisions, and student success once enrolled in college. Some preliminary evidence from selective colleges participating in the College Board's Admissions Research Consortium (ARC) suggests that students who did not take or did not submit SAT/ACT scores during the 2020-2021 academic year performed worse and accumulated fewer credits during their freshman year (2021-2022) than students who did submit scores, suggesting that test-optional policies may have limited colleges' ability to assess students' academic preparation.[45] However, it is unclear to what extent these results may generalize beyond these selective institutions and the initial cohorts most affected by the pandemic. As of spring 2024, some colleges have begun to reinstate admission testing requirements because they have found that the tests do help predict college success.[46] Yet, it remains to be seen how many colleges ultimately move back to pre-pandemic admissions policies.

3.4 Enrollment Declines

In response to the myriad of academic, financial, family, and health challenges facing Americans following the onset of the COVID-19 pandemic, a number of students left or forwent postsecondary education. The National Student Clearinghouse estimates that total undergraduate enrollment at U.S. postsecondary institutions dropped by 3.3% between fall 2019 and fall 2020, and an additional 3.4% between fall 2020 and fall 2021.[47] It was not until fall 2023 that enrollment began to recover toward pre-pandemic levels (see Figure 2).

Like other COVID-era decisions and policies, these enrollment decreases were not felt equally across higher education sectors. Enrollment declines were largest in the community college sector, where total enrollment fell by 8.4% between fall 2019 and fall 2020 and an additional 6.5% between fall 2020 and fall 2021. Enrollment in the sector began recovering in fall 2023, but, to date, still remains approximately 12% below its 2019 level. Several studies investigate this decline in community college enrollment in more detail. One that uses college-level data from the Integrated Postsecondary Education Data System (IPEDS) finds that, across

the higher education landscape, enrollment declines were largest at predominantly Black & Hispanic public two-year colleges, particularly those that had not operated in-person during the earlier phases of the pandemic.[48] Another study leveraging administrative data from California community colleges similarly finds that enrollment declines were largest among Black and Hispanic students, and were larger for continuing students versus new enrollees.[49] Other research shows that enrollment declines were larger for men and that this gender disparity in enrollment declines can largely be attributed to reduced opportunities for "hands-on" education in assembly, repair, and maintenance fields.[50]

In addition to community colleges, institutions that historically have enrolled large numbers of international students also likely faced substantial declines in enrollment due to travel restrictions and visa delays. While many international students who were enrolled in U.S. institutions in spring 2020 remained in the states for the 2020-2021 academic year, the number of *new* students enrolling at U.S. institutions from abroad fell by a dramatic 72%, according to U.S. Immigration and Customs Enforcement.[51] Overall, the number of non-resident students studying in the U.S. fell by 12.9% between fall 2019 and fall 2020,[52] with large reductions in students from China (-14.8%), India (-13.2%), and South Korea (-20.7%) – who, combined, accounted for nearly 60% of all international students in 2019-2020.[53] Figure 3 shows that these enrollment declines occurred evenly among both undergraduate and graduate students, but only graduate student enrollments have rebounded to pre-pandemic levels. As of fall 2022, international undergraduate enrollment still remains approximately 17% lower than its 2019 level, which may be indicative of longer-run declines in the demand for U.S. higher education from abroad.

4 Financial Effects of COVID-19 on Students and Colleges

Immediately following the onset of the COVID-19 pandemic, higher education administrators expressed concern regarding the financial viability and stability of their institutions, particularly if students were not able to return to campuses during the 2020-2021 academic year. In a survey of college presidents between April and July 2020, 61% reported that the COVID-19 pandemic had reduced revenues from room and board, while 73% reported reduced auxiliary revenues (e.g., dining halls, event spaces, on-campus hotels) and 93% reported reduced revenues from special programs (e.g., summer and community programming).[54] At the same time, nearly all presidents indicated an increase in spending on technology (92%), cleaning and maintenance services (90%), and student financial aid (75%). To manage these increased costs amid reduced revenues, many presidents indicated that their institutions implemented hiring freezes (61%), froze employee compensation (54%), and/or furloughed (31%) or laid off (28%) employees. Nationally, the U.S. higher education workforce contracted by roughly 4% from 2019-2020 to 2020-2021,[55] which likely affected not only laid-off workers and their families, but also local economies dependent on colleges.[56]

While the immediate financial effects of the pandemic were stark, the longer-run effects were uncertain as it was unclear when colleges would return to standard, in-person operations. At the time, researchers forecasted that, collectively, colleges could lose $70-$115 billion in revenue over the next five years, with the largest effects projected at very small colleges,

Historically Black Colleges and Universities (HBCUs), and for-profit institutions. Recognizing these potentially large losses – as well as the substantial financial toll that COVID-19 took on students –the U.S. government swiftly provided an unprecedented infusion of federal aid to U.S. colleges.[57]

The first round of federal funding to colleges came in late March 2020 through the Coronavirus Aid, Relief, and Economic Security (CARES) Act, which allocated $14 billion directly to Title IV eligible institutions through the Higher Education Emergency Relief Fund (HEERF I), in addition to funding to states that could be distributed to colleges as well. Subsequent rounds of funding – such as the Coronavirus Response and Relief Supplemental Appropriations Act, 2021 (CRRSA Act) and the American Rescue Plan (ARP) – provided additional rounds of HEERF funding, totaling $76 billion across 2020 and 2021. All rounds of HEERF stipulated that at least 50% of a college's funding must be distributed through emergency aid grants. While there is limited research on these grants to date, one study documents substantial variation in how colleges administered this aid, e.g., whether they made students apply for aid or automatically distributed grants, and whether they made students prove financial hardship or not.[58]

The federal funding to colleges throughout the pandemic helped to buffer against declines in state appropriations[59] and likely played a large role in allowing colleges to remain open throughout the 2020-2022 academic years. However, there are still many outstanding questions in this area to be answered by future research. For example, what were the medium- to long-run effects of the COVID-19 pandemic on institutions' finances? To what extent did these effects differ across institutional characteristics and/or institutions' decisions regarding instructional modalities and staffing reductions? Additionally, how effective were the various federal and state funding responses, both in allowing colleges to remain open and in helping students to remain enrolled and making progress toward their degrees?

5 Other Effects of COVID-19 on Higher Education

Beyond academics and budgetary considerations, many other aspects of life on college campuses were changed by COVID-19. In this section, we discuss research disruptions, employee satisfaction and retention issues, and mental health concerns among students.

Research disruptions in 2020-2022 were common, especially for faculty whose research work relied on travel, interaction with human subjects, or equipment or data housed in labs. One study surveyed scientists in the US and Europe in April 2020 and found that there was an average 7-hour per week drop in research time relative to pre-pandemic.[60] However, reductions in research time were unequal across fields and researcher demographic characteristics. Researchers in fields that rely on lab-based experiments tended to lose more time than researchers in fields like computer science, economics, or mathematics, where research does not often rely on in-person access to equipment. Moreover, women and researchers with young children saw much larger reductions in research time – a finding that is supported by a number of other studies.[61]

COVID-19 also had negative effects on workplace satisfaction among both faculty and

staff. Higher teaching and service workloads are linked to increased reports of stress and burnout among faculty, as documented in several surveys.[62] While there is less work focused on COVID-19 disruption for staff, survey evidence has shown that staff retention became a major issue in the years immediately following the pandemic, which is attributed at least partly to increased availability of remote work in other sectors of the economy.[63]

Finally, the isolation and disruption created by COVID-19 highlighted mental health concerns, especially for students. One study documented a substantial increase in anxiety and depression using longitudinal surveys of students before and after the pandemic at a large public university in North Carolina.[64] A few cross-sectional surveys also document negative mental health effects in other settings.[65]

While there is a great deal of research on the academic challenges presented by COVID-19 in higher education in the US, there are still many open questions about other aspects of college life. This section discusses existing literature on the effects of COVID-19 on research productivity, workplace satisfaction, and student mental health, but there are other areas of campus life that we left off. We set aside a number of other topics, including the effects of COVID-19 on college sports, student participation in Greek life, clubs, and religious organizations, career support services, campus healthcare, and childcare for faculty, staff, and students. There are still open questions regarding how COVID-19 changed these areas of college life in the short- and long-term, and how these changes may have affected outcomes such as college completion and research productivity.

6 Conclusion: Lessons Learned and Future Areas for Research

The COVID-19 pandemic generated an unprecedented and, at times, challenging landscape for higher education, revealing both vulnerabilities and opportunities for innovation. In this article, we have highlighted several key findings regarding the impacts of the pandemic on colleges, students, and faculty and staff. Several important lessons have emerged:

- **Adaptability and Resilience**: Colleges demonstrated remarkable adaptability in shifting to online learning and implementing health policies. Despite challenges with online learning, the ability to pivot quickly was crucial in maintaining educational continuity.
- **Importance of In-Person Learning**: In general, online education during the pandemic had a negative effect on student outcomes. While some institutions and students may choose to continue online learning in the coming years, we expect in-person interactions to remain a core component of the higher education experience for many students.
- **Health and Wellbeing**: The pandemic highlighted the importance of mental health resources and the need for policies that support the well-being of students, faculty, and staff.
- **Financial Challenges**: The financial impact of the pandemic on colleges has been profound, particularly for already financially vulnerable institutions, and may lead to tough decisions in the coming years.

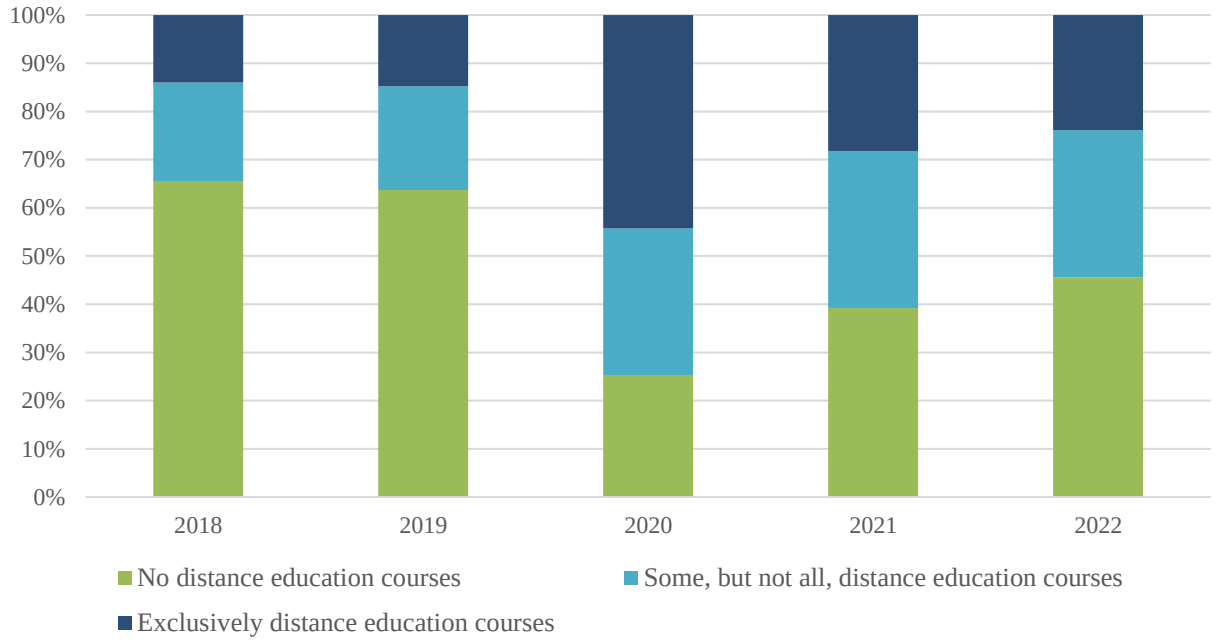
However, there remain several open questions and areas for future research, including:

- How will the pandemic affect long-term enrollment trends and degree completion rates, particularly among disadvantaged groups?
- Which technological and policy innovations adopted during the pandemic will persist, and how can they be optimized for future educational benefit?
- How will colleges recover financially from the pandemic, and how will they ensure financial sustainability in the face of potential future disruptions?
- What are the best practices for supporting student, faculty, and staff mental health in higher education, especially in a post-pandemic world?
- How will COVID-era disruptions to research, along with the rise of remote work options in other sectors, affect the pipeline and composition of higher education faculty and staff going forward?

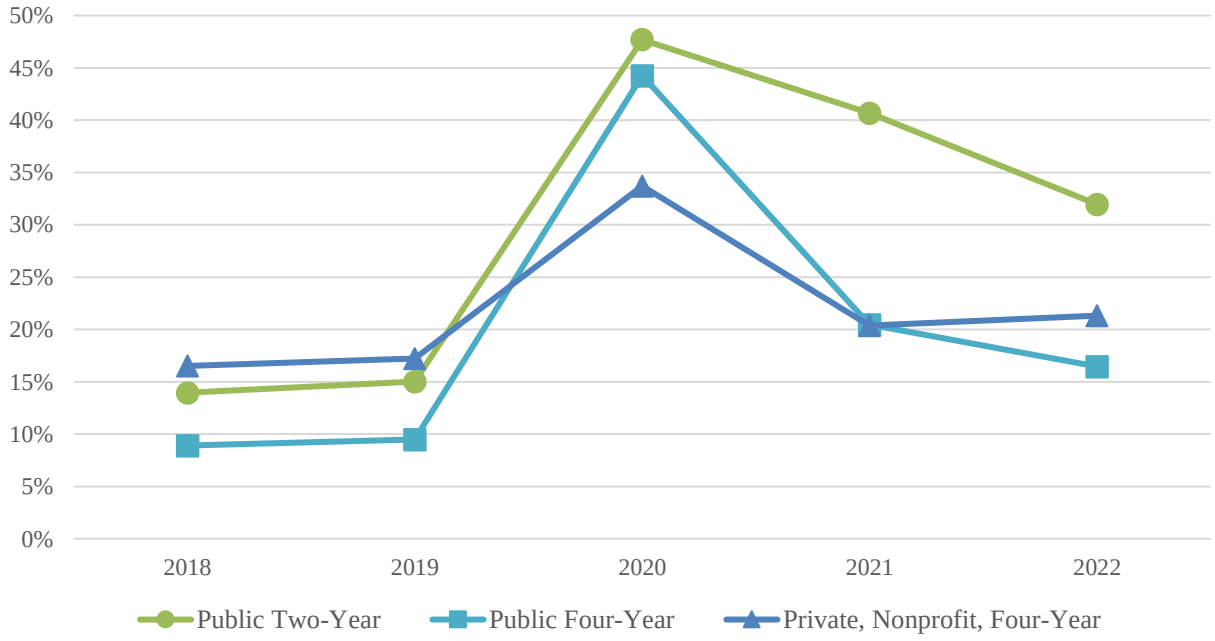
In conclusion, the COVID-19 pandemic has been a catalyst for change in higher education, prompting institutions to act quickly, re-evaluate, and innovate. By learning from the experiences and research conducted during this period, colleges and universities can better prepare for future challenges and continue to evolve in ways that enhance educational outcomes for all students.

Figure 1: Distance Education in the U.S., 2018-2022

(a) Share of U.S. Undergraduate Students Enrolled in Distance Education



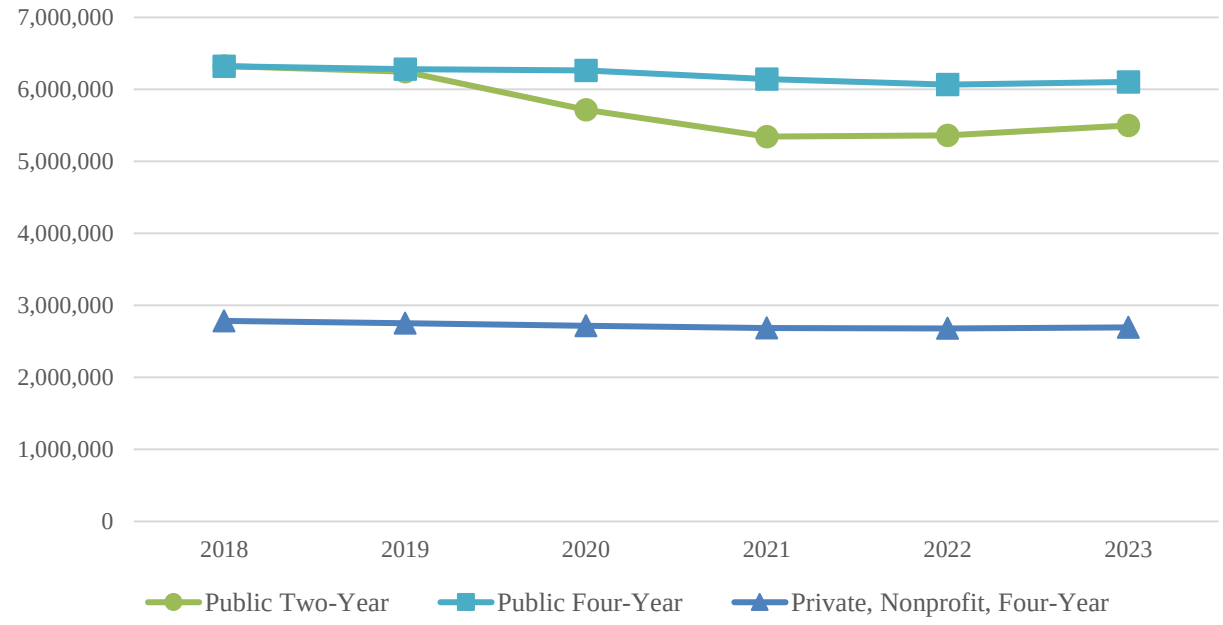
(b) Share of U.S. Undergraduate Students *Exclusively* Enrolled in Distance Education



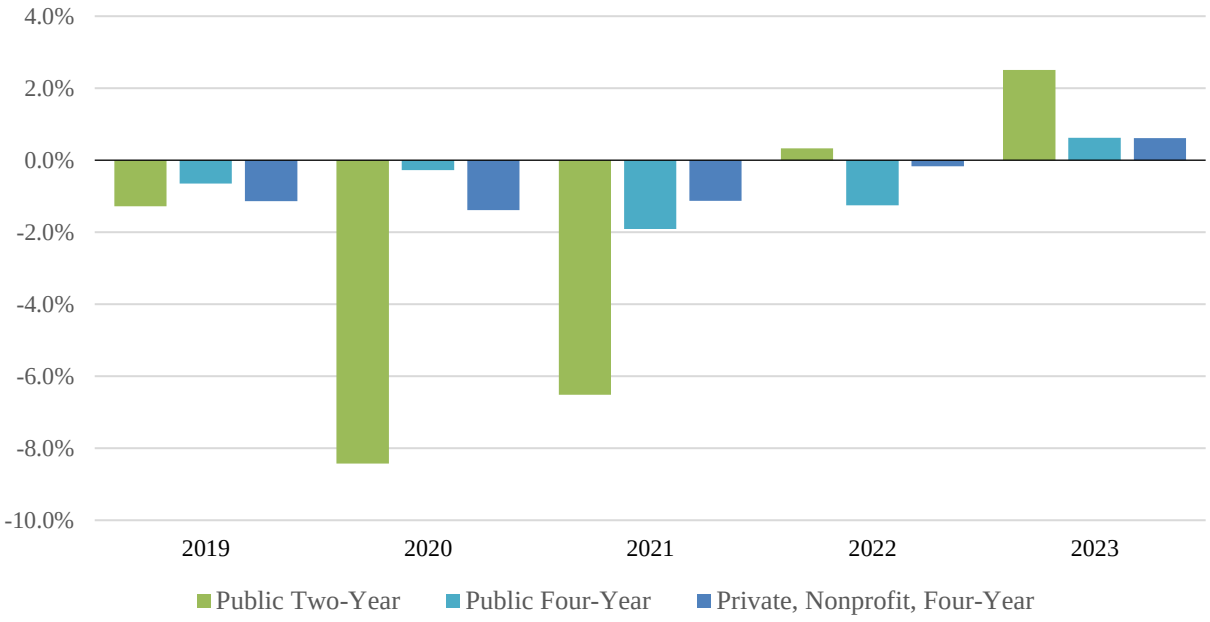
Notes: Authors' calculations from the National Center for Education Statistics (NCES). See *Digest of Education Statistics* Table 311.15. Distance education is defined as "education that uses one or more technologies to deliver instruction to students who are separated from the instructor." We exclude for-profit institutions from the analysis.

Figure 2: Undergraduate Enrollment in U.S. Higher Education, 2018-2022

(a) Fall Undergraduate Enrollment, by Sector



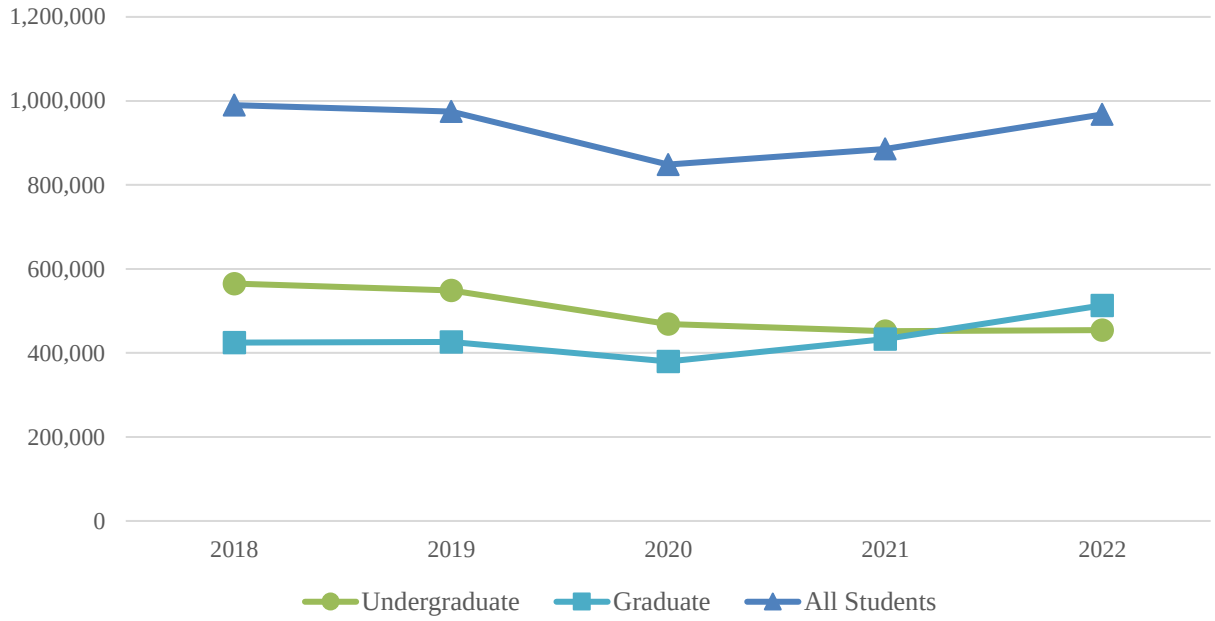
(b) Annual Changes in Fall Undergraduate Enrollment, by Sector



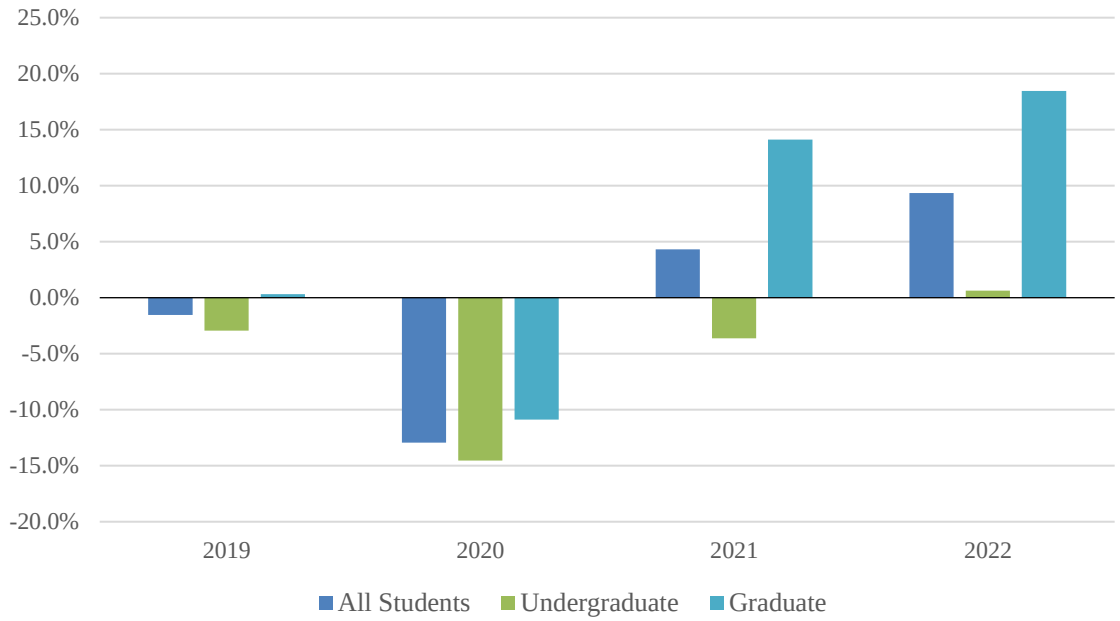
Notes: Authors' calculations from National Student Clearinghouse (NSC). See Current Term Enrollment Estimates: Fall 2023. The "public two-year" sector includes institutions whose highest degree is an associate's degree, as well as bachelor's degree-granting institutions that primarily award associate's degrees. We exclude for-profit institutions from the analysis.

Figure 3: International Enrollment in U.S. Higher Education, 2018-2022

(a) Fall International Enrollment, by Level of Student



(b) Annual Changes in Fall International Enrollment, by Level of Student



Notes: Authors' calculations from the National Center for Education Statistics (NCES). See *Digest of Education Statistics* Table 306.10. International, i.e., nonresident, students include anyone "who is not a citizen or national of the United States and who is in this country on a visa or temporary basis and does not have the right to remain indefinitely."

Endnotes and References

[1] Throughout this article, we use "colleges" to refer to all types of higher education institutions, although we primarily focus on public and private, not-for-profit institutions that enroll undergraduate students.

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