



Online Career and Technical Education Programs during the Pandemic and After

A Summary of College Survey Findings

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Nearly all students who were enrolled in postsecondary career and technical education (CTE) programs in 2020 are likely to have taken at least one course online after the outbreak of the COVID-19 pandemic in the United States in March of that year. To understand how the pandemic has accelerated the transition of CTE programs online, Urban Institute researchers administered a rapid-response survey in partnership with the CTE CoLab coalition (box 1) in December 2020 to community and technical colleges across the country. In this brief, we explore how the pandemic has prompted these colleges to change the delivery of for-credit CTE programs and provide considerations for institutions transitioning programs online.

The survey (the “CoLab survey”) was fielded from December 2 through December 11, 2020, to community and technical colleges in our national partner network to gather timely insights into their approaches to online learning. We wanted to understand the availability of online and hybrid programs before the pandemic, shifts occurring during the pandemic, and plans for course delivery after it ends. This brief is a companion product to Anderson and coauthors’ 2021 report, *Racial and Ethnic Equity Gaps in Postsecondary Career and Technical Education*, which explores equity gaps for students of color—especially Black students, Latinx students, and Indigenous students—in postsecondary CTE programs and offers a framework for improving outcomes at the course, program, and institutional levels.

BOX 1

The CTE CoLab and College Community of Practice

The CTE CoLab aims to reduce equity gaps for students of color—especially students who are Black, Latinx, or Indigenous—enrolled in credit-bearing online postsecondary CTE programs. Funded by ECMC Foundation, the CTE CoLab is a collaboration led by the Urban Institute in partnership with five national organizations: World Education, Inc., the National Council for Workforce Education, the Office of Community College Research and Leadership at the University of Illinois at Urbana-Champaign, the Instructional Technology Council, and the National Coalition of Advanced Technology Centers. This coalition supports the College Community of Practice—a group of community and technical colleges—to build knowledge, center equity in program goals and delivery, and develop and share resources to improve education and career outcomes in online CTE programming. Learn more at <https://www.urban.org/policy-centers/income-and-benefits-policy-center/projects/career-and-technical-education-colab>.

The CoLab survey included questions about the following programs: automotive repair; business administration; early childhood education; licensed practical nursing; heating, ventilation, and air conditioning; information technology help desk/technical support; manufacturing technologies; and welding. These programs were included because they represent a variety of industry sectors across the many different types of credit-bearing postsecondary CTE programs. Among the 104 unique respondents that started the survey, a total of 78 unique respondents completed surveys, representing 69 colleges across 30 states.¹

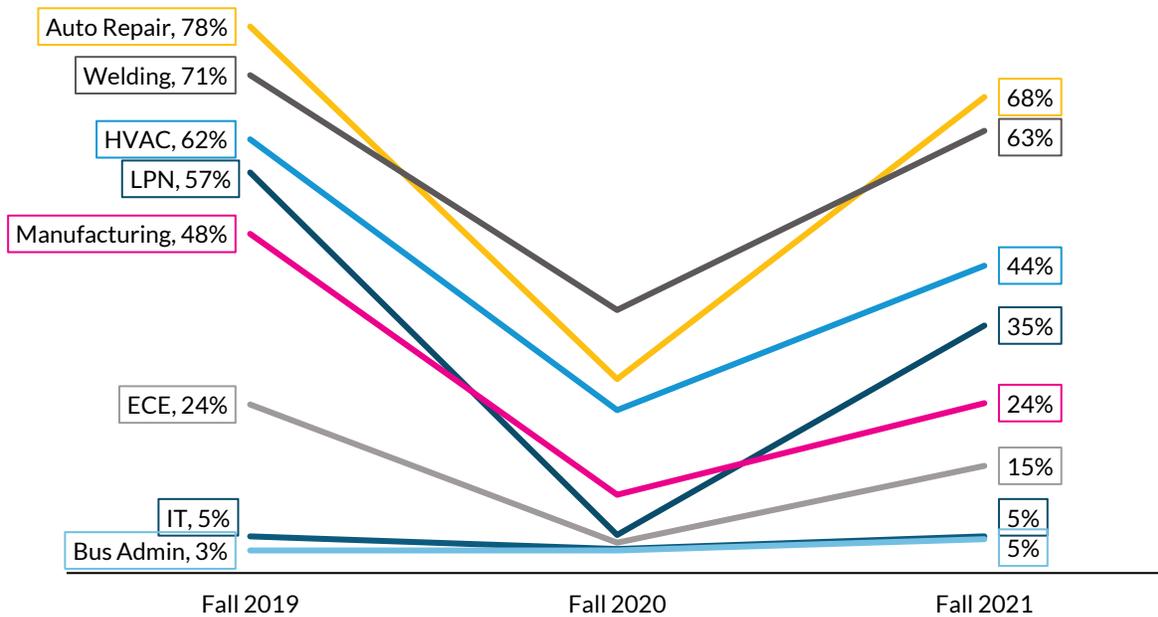
Patterns of CTE Program Delivery

The CoLab survey asked respondents whether their colleges had plans for offering CTE courses or programming in person (i.e., on campus), in a multitrack format (i.e., some programs or cohorts are in person, others online), in a hybrid format (i.e., programming combines online and face-to-face content delivery),² or fully online. Respondents were also asked to reflect on their colleges' modes of program delivery during three periods: fall 2019 (before the pandemic), fall 2020 (during the pandemic), and fall 2021 (after the pandemic). We asked respondents to assume the pandemic would end before the fall 2021 semester.

The data in figures 1 and 2 are restricted to respondents who provided information about their CTE programs for all three periods, and to programs offered for credit during each period. Figure 1 shows rates of in-person instruction for fall 2019 and fall 2020 and plans for fall 2021 programming. Figure 2 shows the shares of programs moving from in-person instruction to a hybrid modality and from a hybrid modality to in-person instruction from fall 2019 to fall 2021 (i.e., pre- to postpandemic). The data are ordered from the largest share of programs moving from in-person to hybrid instruction to the smallest.

FIGURE 1

Share of Postsecondary CTE Programs by Sector Delivered in Person in Fall 2019, 2020, and 2021 (before, during, and Projected to Follow the Pandemic)

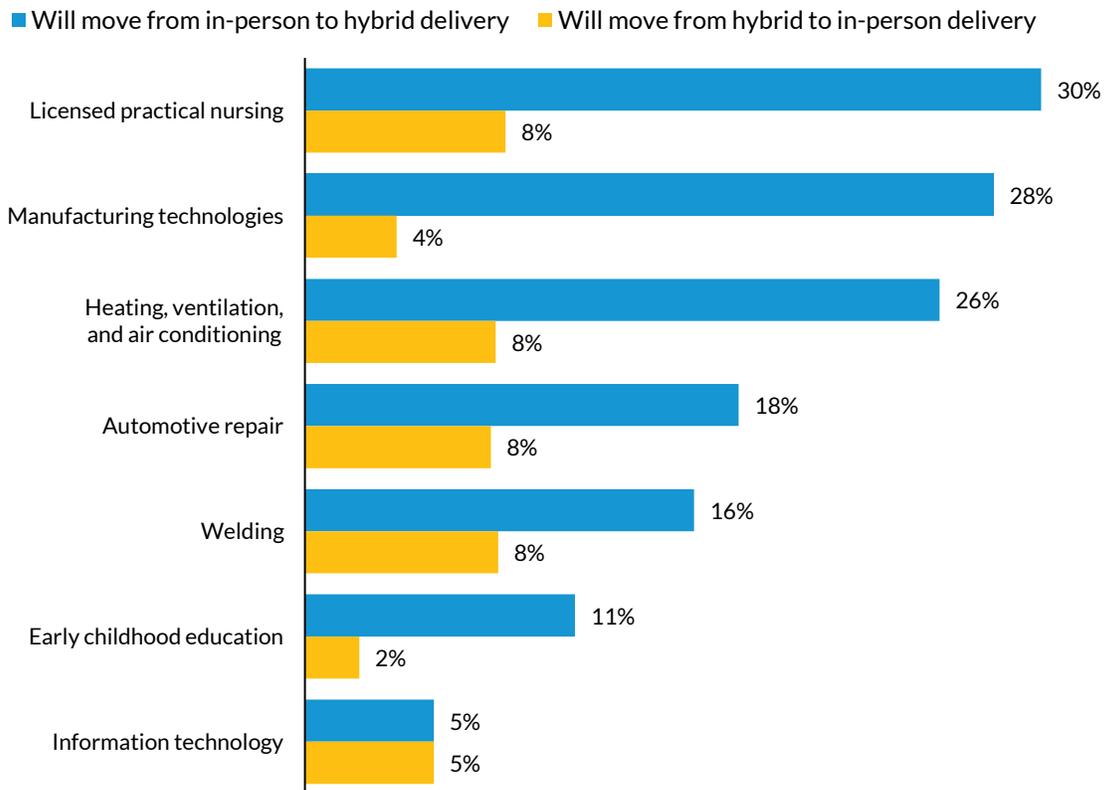


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Source: Survey of community and technical colleges administered by the CTE CoLab, December 2 through December 11, 2020.
Notes: Auto repair = automotive repair. bus admin = business administration. CTE = career and technical education. ECE = early childhood education. HVAC = heating, ventilation, and air conditioning. IT = information technology. LPN = licensed practical nursing. Survey respondents were asked to assume that the pandemic would end before the fall 2021 semester.

FIGURE 2

Colleges' Expected Changes to Postsecondary CTE Program Delivery from Fall 2019 to Fall 2021



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Source: Survey of community and technical colleges administered by the CTE CoLab, December 2 through December 11, 2020.

Notes: CTE = career and technical education. The number of college staff who reported on their college's mode of CTE program delivery by program for all three periods (i.e., before, during, and after the pandemic) varied from a low of n=38 (for licensed practical nursing programs) to a high of n=58 (for information technology). This figure does not show shifts to or from fully online or multitrack approaches because no programs that started in person planned to shift to or from those modalities, with the exception of business administration (2 percent of business administration programs anticipated shifting from a multitrack to an in-person modality by fall 2021).

Summary of Key Findings

Survey responses regarding patterns of program delivery indicate the following:

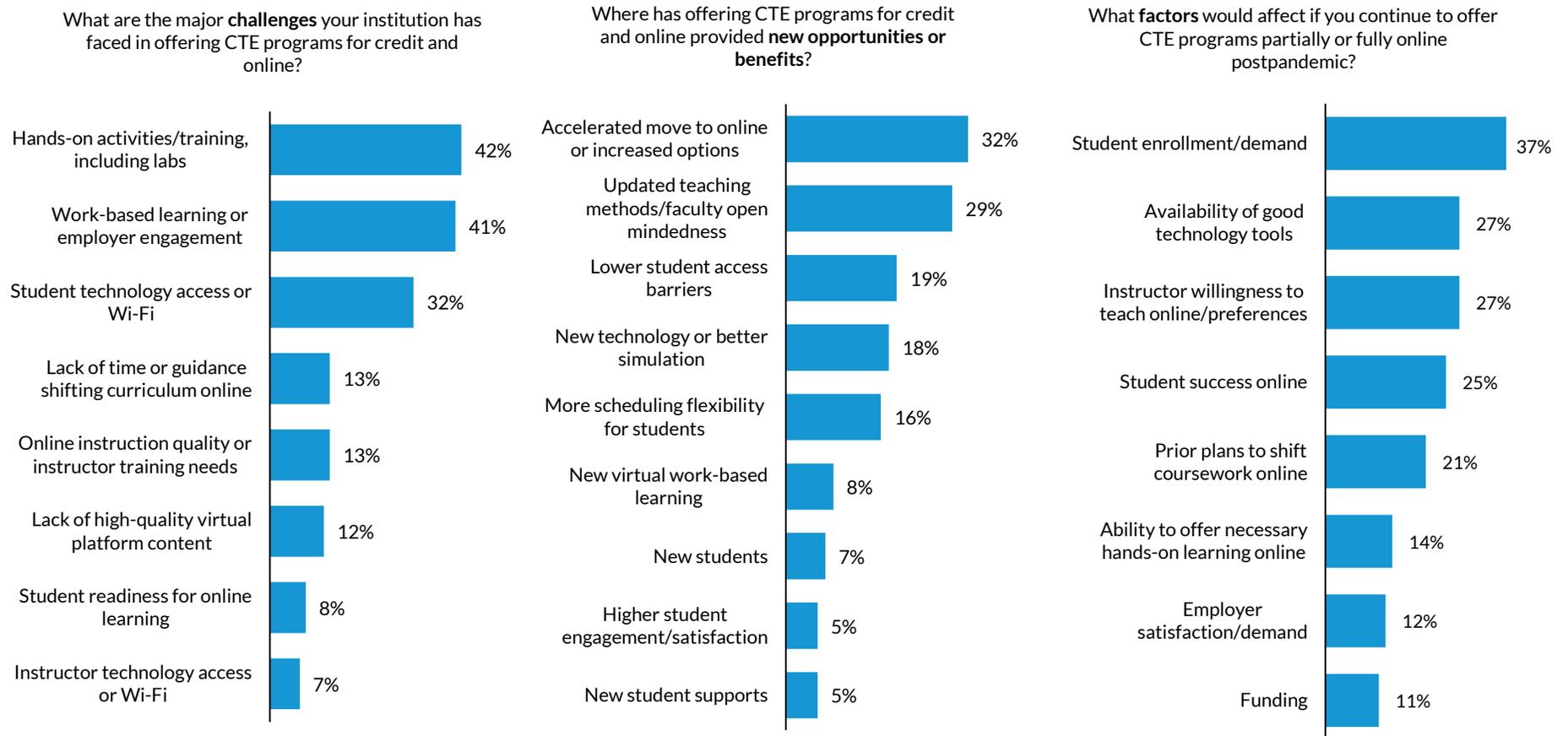
- **Across all CTE programs included in the survey, the most common mode of delivery before the pandemic was in-person instruction.** The sectors with the highest rates of in-person instruction according to respondents were automotive repair (78 percent) and welding (71 percent). The V-shaped patterns in figure 1 signal that in-person instruction was sharply reduced for many kinds of programs as colleges shifted to emergency remote learning. Many respondents anticipate returning to in-person instruction after the pandemic.
- **Rates of in-person instruction are predicted to be lower after the pandemic than before for six of the eight types of programs included in the survey.** Exceptions include information technology programs, where in-person instruction rates are expected to stay the same (5 percent) from fall 2019 to fall 2021 and business administration programs, where rates of in-person instruction are expected to increase, from 3 percent before the pandemic to 5 percent after the pandemic.
- **The largest shift in program delivery that we observed is toward hybrid delivery after the pandemic.** The anticipated shift toward hybrid programming after the pandemic (see figure 2) is particularly pronounced in the following programs: licensed practical nursing (30 percent of programs) are expected to shift from in-person delivery prepandemic to hybrid delivery postpandemic), manufacturing technologies (28 percent are expected to shift), and heating, ventilation, and air conditioning programs (26 percent are expected to shift).

Challenges, Opportunities, and Considerations

CoLab survey respondents also provided open-ended responses to questions about any challenges, opportunities, and factors that impacted whether or not they anticipated continuing to offer for-credit CTE coursework online after the pandemic. We qualitatively coded these responses into themes summarized in figure 3.³ Key themes included access to necessary technology, preparation for and interest in online learning among students and instructors, challenges related to engaging in employer partnerships and hands-on learning online, and contextual factors that affect online course offerings. We explore each of these themes in detail below.

FIGURE 3

Most Common Challenges, Opportunities, and Other Factors Associated with Online CTE Program Delivery Because of the Pandemic



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Source: Survey of community and technical colleges administered by the CTE CoLab, December 2 through December 11, 2020.

Notes: CTE = career and technical education. Seventy-six respondents reported on challenges and 73 respondents reported on opportunities and other factors. Percentages are of these denominators. For some of these categories (e.g., challenges), there was more than one respondent from the same college, but they frequently provided distinct perspectives and were therefore counted separately.

Access to Necessary Technology

Nineteen percent of respondents indicated that online delivery can lower barriers to student access to programming, enabling colleges to serve students outside their immediate vicinity. However, 32 percent of respondents indicated that the need for students to access technology and wireless internet presented roadblocks for teaching and learning online.⁴

Poor equipment, lack of strong internet access, and lack of privacy at home [impact the online learning experience] for many low-income students. –CTE CoLab survey respondent

Although challenges regarding access were commonly cited, college staff also shared that office hours, tutoring, and information sessions can be more easily offered virtually than in person. Moreover, 16 percent of respondents indicated that flexibility in scheduling is useful, and some mentioned it is useful for adults who work, tribal learners, and student parents in particular. In this way, the shift to online courses and programs has presented an opportunity to lower barriers to student access.

Preparedness for and Interest in Online Learning among Students and Instructors

Eight percent of respondents indicated that student readiness for online CTE learning is a challenge; examples of students described as lacking readiness include tactile learners who need to manipulate things with their hands to internalize knowledge, and students who lack career readiness owing to limited professional experience.

Moreover, 13 percent of respondents indicated the quality of online instruction and/or the need for faculty to be trained can be a challenge in delivering for-credit CTE programming online, such as when content is being delivered by industry professionals or adjunct instructors who teach part time. Some respondents shared that sudden shifts to online learning without proper training of legacy/tenured instructors have accelerated rates of instructor retirement, although this may owe to other factors such as health concerns among an older, more vulnerable segment of the workforce.

Despite these challenges, 32 percent of respondents saw the move to online programming precipitated by the pandemic as an opportunity to offer more courses permanently online. Some (7 percent) thought they would be able to serve new student markets, and many (29 percent) indicated that in the long term, online programming will allow them to update their teaching methods, highlighting that the experience of teaching during the pandemic has expanded their views about instructional approaches to teaching online.

Being forced to pivot to online/hybrid has opened the eyes of many faculty to the possibilities of these formats. The development of online lectures, demonstration videos, and other curricular materials, while a burden on most faculty to develop in such a short time with limited experience, are being seen by many to be a benefit to existing courses when we can return to in-person classes. –CTE CoLab survey respondent

Employer Partnerships, Work-Based Learning, and Hands-on Training

The challenges that respondents most commonly cited included hands-on activities and training such as labs (42 percent of respondents) and challenges involving work-based learning and employer partnerships (42 percent of respondents). In many cases, sectors with professions involving the physical manipulation of tools such as construction and manufacturing require hands-on training, and programs cannot offer those experiences fully online. Because of this, 12 percent of survey respondents shared that they were concerned about employers trusting the quality of online learning. Some respondents hope to partner with employers to develop quality programming for particular industries so they can build employer support into the development of virtual content.

Eighteen percent of respondents indicated that new technology and better simulation can provide opportunities for students to experiment with hands-on learning environments virtually. But many respondents (12 percent) had not been able to find acceptable or quality virtual platforms to deliver content that would otherwise be taught in a lab setting. Virtual learning may be more possible in sectors well suited to online platforms, such as information technology.

Some respondents indicated that there are advantages to engaging with employers online and to virtual labs. For example, 8 percent said online CTE programming can provide students new work-based learning experiences and opportunities to meet a wider range of employers through virtual career fairs. In addition, 16 percent indicated that online programming affords additional scheduling flexibility for course meetings, which may free up time for students to spend in in-person labs.

Simulation software does not replace hands-on patient care training needed to develop competent health care professionals. Skills labs via Zoom or Teams have been problematic at times because students need time to practice skills. –CTE CoLab survey respondent

Other Contextual Factors Affecting Online Course Offerings

Our survey findings reflect that declining enrollment at community colleges is a primary concern: 37 percent of respondents indicated that maintaining enrollment levels when moving programs online during the pandemic was a challenge. This is supported by data from the National Student Clearinghouse Research Center which shows that enrollment in community and technical colleges is down nearly 10 percent in spring 2021 from a year ago, and enrollment among Black students, Latinx students, and Indigenous students has declined by 13 percent, 14 percent, and 17 percent, respectively, compared with a 10 percent decline among white students.⁵ Declining enrollment means colleges face financial constraints that make it hard to invest in professional development for new faculty and institutional technology resources.⁶ Moreover, 11 percent of survey respondents indicated that the availability of funding will be a factor when deciding whether to offer online programming in the future. For example, several respondents that had identified promising tools for virtual learning during the pandemic, such as advanced simulation tools, were concerned about costly ongoing licensing fees after it ends.

We invested a lot into a simulation that requires continued, annual licensing that now needs to be funded annually. —CTE CoLab survey respondent

Some respondents (11 percent) also wanted to ensure that instructors and programs could maintain quality standards in an online environment. Considerations around quality include other factors that can affect online course offerings, such as policies, rules, and regulations that impact for-credit college CTE programs. These include certification, licensing, and accreditation requirements that have traditionally required students to take exams in person to demonstrate skills or to be present for in-person learning hours. Some respondents (7 percent) shared that for remote learning to be successful in industry sectors with clinical or safety regulations such as health care, requirements must accommodate online or hybrid modalities. Some states have flexed accreditation requirements to allow for more online program delivery during the pandemic, but it is unclear whether these waivers will be made permanent.

Implications and Next Steps

The COVID-19 pandemic has accelerated the transition of postsecondary CTE programs to online and hybrid delivery. This has presented numerous challenges, opportunities, and considerations for these programs. Despite challenges in the rapid transition online, staff from many community and technical colleges indicated that they anticipate continuing to offer more programs online and/or through a hybrid learning approach after the pandemic. Given this shift—particularly to hybrid course delivery models—it is imperative for colleges to invest in technology access and preparedness for students and instructors. Such investments would better enable programs to provide high-quality, effective, and equitable opportunities to students who face barriers to online CTE programming, including students of color.

Notes

- ¹ Five colleges had two respondents and three colleges had three respondents. One respondent did not specify their college. In most cases, multiple respondents provided information about a different set of programs and provided a unique perspective. Therefore, we did not collapse responses by college. Eleven responses came from people not affiliated with a community or technical college. Those responses were dropped from the analysis and are not included in the data in this brief.
- ² Online education involves a continuum of instructional approaches ranging from traditional in-person instruction, to hybrid (also known as blended) programming that combines in-person and online instruction, to fully online courses and programs.
- ³ When discussing the open-ended responses to the survey, when we say, for instance, that a certain share of respondents reported something, we mean the share of all respondents who reported about challenges, opportunities, or other factors, as applicable. Seventy-six respondents reported on challenges and 73 respondents reported on opportunities and other factors.
- ⁴ See Campos-Castillo (2015) for more information on the digital divide in college programs.
- ⁵ “COVID-19: Stay Informed with the Latest Enrollment Information,” National Student Clearinghouse Research Center, March 11, 2021, <https://nscresearchcenter.org/stay-informed/>.
- ⁶ For information on the importance of investing in professional development for faculty and in institutional technology resources, see Alexandra Mihai, “This Pandemic Must Bring Faculty Development to the Fore,” Times Higher Education World University Rankings, February 2, 2021, <https://www.timeshighereducation.com/opinion/pandemic-must-bring-faculty-development-fore>; Madeline St. Amour, “Faculty Face Uphill Battle Adapting to Needs of Today’s Students,” Inside Higher Ed, April 30, 2020, <https://www.insidehighered.com/news/2020/04/03/faculty-face-uphill-battle-adapting-needs-todays-students>; and “Adaptive Teaching at Vanderbilt: Investing in New Classroom Technology to Support Faculty This Fall,” Vanderbilt University Division of Communication, June 19, 2020, <https://news.vanderbilt.edu/2020/06/19/adaptive-teaching-at-vanderbilt-investing-in-new-classroom-technology-to-support-faculty-this-fall/>.

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