Cognizant

The Work Ahead in Higher Education: Repaving the Road for the Employees of Tomorrow

Higher-ed institutions expect pandemic-driven disruption to continue, especially as hyperconnectivity, analytics and AI drive student engagement, greater educational access and personalized education models over the lifetime of the learner, according to our recent research.

THE WORK AHEAD

Executive Summary

With the sudden pivot to online learning, renewed awareness of education inequities and disenfranchised workers left to ponder their place in the future economy, higher education is now in the throes of a major reinvention.

What is the role of the modern university? Is it a four-year rite of passage for coming of age? A manicured playground for elites to meet their future spouses and business partners? A way to adorn your LinkedIn profile with a brand that heralds symbolic value? A springboard for study abroad, or even the modern-day equivalent of aristocratic Europe's "Grand Tour"?

If this is the direction in which colleges and universities were headed prior to the pandemic, it came to a screeching halt in 2020. With the sudden pivot to online learning, renewed awareness of education inequities and millions of laid-off workers forced to ponder their place in the future economy, institutions of higher education are now in the throes of a major reinvention.

The steady encroachment of the digital economy into our everyday lives was already casting doubt on the ability for traditional learning institutions to keep up with the new and continuously changing skills required for the future of work. Now, the years-long, high-priced, once-and-done approach to earning a degree — and settling into a life-long career with those credentials in-hand — looks even more obsolete, as do the currently inflexible ways and means of acquiring that learning in an affordable and flexible way.

The open question is whether the dawn of the Fourth Industrial Revolution represents a time of "peak college" or, at long last, a watershed moment that catapults higher ed into modernity.

To understand the changing nature of education in a world dominated by digital and disrupted by the pandemic, Cognizant's Center for the Future of Work surveyed 4,000 senior executives across industries and globally, including 285 higher-ed respondents (see methodology, page 20).

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Five key themes emerged from our research and analysis regarding the future of work for institutions of higher education:

1 **Industry disruption is accelerating — fast.** Among higher-ed respondents, 45% think the pace of industry disruption will accelerate as a result of the pandemic. Increasingly, educators need to rethink the rigid, lengthy approach to earning a degree and find more fluid, democratized and flexible ways to foster the skills and credentials needed in an increasingly complex and fast-changing world.

2 **Intelligent systems and connectivity are key.** More than half of respondents are doubtful their existing educational systems are ready for the adaptations needed. The way forward, however, is clear: The greatest drivers of change named by higher-ed respondents are hyperconnectivity (45%) and artificial intelligence (42%), which will drive student engagement, greater educational access and personalized education models over the lifetime of the learner.

3 **Digital dominance will require greater tech investments.** There is a pronounced gap in the reality of funding the digital initiatives needed to catapult higher ed into competitive leadership of tomorrow. At the same time that higher-ed respondents think their digital revenue channels will double by 2023, they're planning to increase their investments in tech (as a percent of revenue) by just 3.5 percentage points (among the lowest of the industries we surveyed).

4 **AI is the answer to an increasingly quizzical future.** About one-third of respondents have implemented big data or AI systems, and others have pilots in flight to do so. While this may disrupt the status quo at first, it's necessary to drive better insights, student engagement and personalized experiences across traditionally siloed higher-ed institutions.

5 **Upskilling is paramount.** As smart systems yield greater student engagement, higher-ed institutions will need to increase faculty training and support to optimize "teaching" in this new environment.

A digital rethink of learning is the order of the day. If there's one constant that will rule education moving forward, it's change.

The end of the old-school

Half of higher-ed respondents agree that greater uptake of digital technologies and the post-pandemic environment itself will push them to work faster, and 45% think the pace of industry disruption will only accelerate.

When the pandemic hit, instructors and professors at all levels of the education spectrum pivoted in their jobs as few workers ever have. The crisis posed an existential challenge to every educational leader around the world, who suddenly needed to reimagine how to operate in a world of remote presence, social distancing and considerable economic stress.

And most, it seems, believe the changes to their professions and institutions have only just begun. As seen in Figure 1, half of higher-ed respondents agree (to a significant extent) that greater uptake of digital technologies and the post-pandemic environment itself will push them to work faster, and 45% think the pace of industry disruption will only accelerate. As COVID-19 digitized the world of education at light speed, it became clear that much more was possible in terms of using these tools and techniques to meet education needs that had been burgeoning for some time (see Quick Take, next page).

All this is happening at a time when seemingly reliable norms like standardized testing, on-campus learning and the tenure track have also been thrown into the sharp light of disequilibrium due to not just the pandemic but also skyrocketing levels of student debt and high-profile admissions scandals (hello, "Varsity Blues"[1]).

From a student point of view, a year of distance learning (and taking on further student debt) serves as a backdrop to these major drivers of change. The college-aged members of Gen Z now have further reasons to question the value of higher ed to position them for their chosen career or "job of the future."

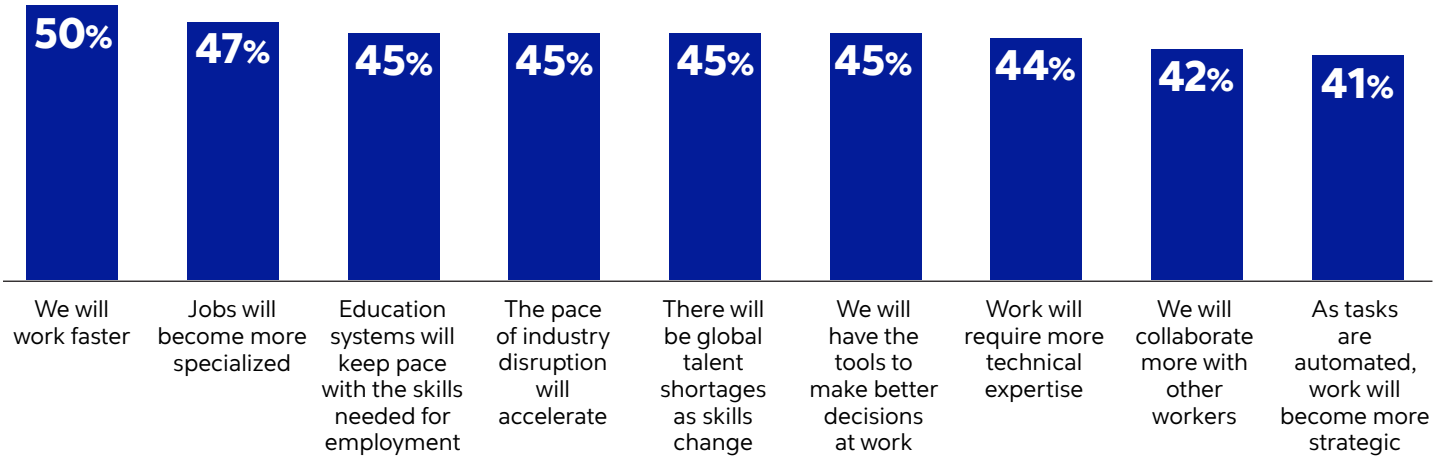
Meanwhile, the tension between "tenure" (needlessly over-credentialed professors) and "10-year university" (needlessly over-credentialed students) is reaching a breaking point: While the percent of people in the U.S. with a four-year diploma reached 36% in 2019, up from 9% in 1965,[2] a large majority of graduates who took out student loans (68%) have yet to pay them off a decade after being in the workforce.[3]

Higher-ed schools have their own economic factors to consider. A stroll through a university campus of any size this past academic year revealed how, even months after the pandemic hit, large buildings normally dedicated to learning sat as empty totems to March 2020, affecting everything from attendance by international students, to deferral rates and funding.[4]

In the UK, universities face potential losses running into billions of pounds if international students turn down the prospect of "online learning abroad" at relatively high tuition fees.[5] Meanwhile, due to fewer high school graduates and a stagnant ROI, overall enrollment at two- and four-year institutions in the U.S. is diminishing even as top-tier universities are burdened with the opportunity of record enrollment.[6]

More disruption ahead

Respondents were asked to what extent work would be transformed between now and 2023.
(Percent of respondents saying they strongly agree)



Response base: 285 higher-ed senior executives
Source: Cognizant Center for the Future of Work
Figure 1

Quick Take

The end of Zoom doom and gloom?

The entry of the coronavirus in 2020 catalyzed experiments with scaled online learning at virtually every school and university, worldwide. Yet so far, distance learning too often means staring at a back wall of no-cam names — students simultaneously alone, together.

Going forward, students will expect to learn differently from how their parents (or even older siblings) did. In a digital-first world, they will expect content that responds to them. Learning experiences will offer Amazon-like ease of access and be highly compelling, even binge-worthy, drawing students from one module to the next like the latest Netflix series.

In a hyperconnected world, rote classroom activities will give way to a fusion of lesson plans with pick-and-choose, asynchronous, video game-like distance learning options (or motion-activated learning while on the move, with an audio lecture or podcast and no screens or devices at all), all galvanized by instructors with captivating online personalities that foster far better student engagement than physical classrooms can.

Case in point: University leaders in the UK, using the 2020 virus as an inflection point, forged a 2030 digital strategy framework that calls for incorporating the digital experiences of the consumer world. Their charter states: "Consumer market leaders such as Netflix, Apple or Uber apply data-driven decisions and provide dynamic experiences based on an individual consumer's information. Applying these same design principles to higher education can transform the way our stakeholders experience learning, teaching, research and professional services."[7]

Judicious application of technology will be the catalyst. Communicating with remote-based students, for example, has been a puzzling process for faculty who aren't sensitized to understanding the frequency and nature of outreach essential for keeping online students engaged. Too often, once the online class begins, it's left to the individual charisma of the instructor to ensure engagement.

Instead, technology should be used to "nudge" or check in with students, whether through chatbots, texting, conversational AI or other mechanisms, using analytics and machine-learning algorithms to detect when such engagement would be most effective, to make student communications easier, constructive and persistent.

What does that portend for the future of learning? Like musicians or filmmakers, we might see teachers and professors begin to franchise or license lessons with on-demand revenue allocation. The rise of offerings like Master Class — a fee-based streaming platform that offers stepwise lessons from the world's virtuoso storytellers, chefs, filmmakers, etc. — provides an idea of how this might work.[8]

The force multiplier is the level of scale and engagement that can be obtained online. A glance at the music industry is instructive: Today, recorded music is a loss-leader for far more lucrative live concerts (assuming global contagion is not a factor). Applied to education models of tomorrow, it's conceivable that online revenues from teaching might be the loss-leader to (far more lucrative) in-person "lectures-as-concerts." Or, said differently, in the inimitable words of music industry mogul Jay-Z, "I am not [just] a businessman. I am the business, man."[9]

New drivers of learning: connectivity, AI, analytics

AI was already becoming a gamechanger for higher ed — for everything from online tutoring and assessment programs, to creating tailored and personalized education experiences for students in both physical classrooms and virtual learning environments.

Changes in education were needed even before the pandemic struck. With the new and ever-changing skills required to meet the rise of AI, analytics and automation in the workplace, students are now faced with the prospect of having not one but multiple careers in their lifetime, making the traditional linear model of education-employment-career inadequate.

The rigid educational and career pathways that served students for decades aren't designed for developing skills in a fast-changing market or matching the speed of changing industry requirements.

Higher-ed respondents expressed doubt about their ability to deliver on the flexibility, agility and adaptability needed to meet these and other demands, with only 45% saying they're sure their existing systems are keeping pace with the skills needed for employment. Our prior research mirrors this concern. When senior leaders from both the business and education sectors were asked about preparing the future workforce, education respondents were much more likely to express concern about their ability to deliver this level of learning, with 84% saying they were highly concerned vs. 58% of business respondents. (For more on this topic, see our report "**Relearning How We Learn, from the Campus to the Workplace**.")

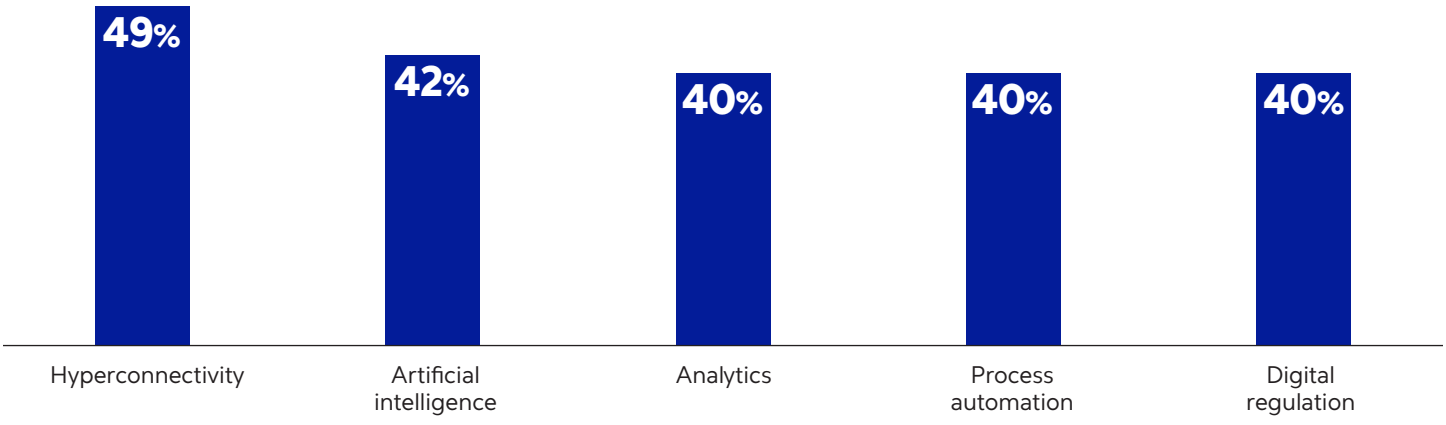
Respondents, however, seem clear on the drivers that will significantly reshape the new education delivery model, namely hyperconnectivity (45%), artificial intelligence (42%) and business analytics (40%). AI was already becoming a gamechanger for higher ed — for everything from online tutoring and assessment programs, to creating tailored and personalized education experiences for students in both physical classrooms and virtual learning environments. And given the centrality of data — clean, believable, real-time data reflecting the needs and behaviors of individual students — its preeminence goes hand-in-hand with the importance of AI.

For example, Pearson Education, an educational publishing company, allows students to pay for a semester-long subscription to its software offerings that can be consumed on any device. The company is now bringing AI to textbooks by providing supplemental readings, extra quizzes and even a virtual tutor to students struggling with certain concepts.[10] Using AI-driven hyper-personalization, educators can determine shortcomings and steer students to content that can quickly provide remedial help and mastery over time.

Higher-ed institutions can also use predictive analytics to forecast workforce needs and curate flexible, adaptive and continuously updated learning content that enables learners to rapidly acquire new skills. In time, the relevance of these new modes of education delivery may eclipse the multi-year "degree," as standardized credentials (and micro-credentials)

The future of learning: intelligent and connected

Respondents were asked about the impact of the following technologies and trends on work between now and 2023.
(Percent of respondents saying significant impact)



Response base: 285 higher-ed senior executives
Source: Cognizant Center for the Future of Work
Figure 2

drive a renaissance of higher learning (see Quick Take, below). Witness what happened in 2020, which saw an estimated 70% increase in short-term credential classes year-over-year.[11]

Already, careers in cybersecurity are based on a series of certifications that define an individual's career path and future job prospects. The same approach can be applied to honing soft skills, like leadership, analytical thinking, communication, strategic thinking and learning. Think about it: How many who have majored in, say, history, went on to be history professors or write books? Very few. Instead, the relevant skills learned in these programs are related to analytical thinking, in addition to a grounded basis from which other business disciplines like long-range strategy can flourish.

As campuses become increasingly intelligent, safety and security are becoming a greater concern — and that includes digital safety. It's worth noting that concerns about security and privacy, while cited by just one-third of higher-ed respondents as having a strong impact by 2023, are still quite relevant as more institutions and education suppliers increase digital initiatives. For example, in the UK, the National Cyber Security Centre has sent out specific alerts as schools, colleges and universities alike grapple with bad actors promulgating ransomware exploits with increasing frequency.[12] Assessing digital maturity in these arenas will be essential work ahead for all universities.

Quick Take

An adaptive charter for jobs of the future

In response to the increasing misalignment between higher-ed curriculum and fast-changing workforce skills, educational institutions have begun showing greater interest in industry-influenced collaborative programs. For example, Strategic Education, Inc., owner of Strayer and Capella, recently created a new business unit called Alternate Learning, whose Workforce Edge platform knits companies' education benefits to the offerings of online universities.[13]

Germany's Siemens AG has been working in partnership with Michigan's Oakland University to provide new engineering technologies, services and solutions to boost students' currency with key tools they might use straight out of school. Similarly, learners at California Polytechnic State University's Digital Transformation Hub are studying in a department that affirms it's "powered by AWS."[14]

At the University of Manchester in the UK, a large-scale, university-wide program called "Invest in Digital Futures" is spearheading research on the transformative potential of digital technology, and is developing skills in such areas as next-gen infrastructure and data analytics.[15]

Businesses and educators know they need to prepare people for very different jobs in the future of work, but they've been slow to revamp their education and training models or collaborate with each other, according to our research. (For more on this topic, see our report "Relearning How We Learn, from the Campus to the Workplace.") What's needed are more flexible partnerships, predictive and agile approaches to skills identification and curriculum change, and digitally driven modes of delivery to prepare people for what comes next.

Investments needed for digital dominance

While just 5.6% of higher-ed respondents' revenues are derived through digital channels today, that figure is expected to nearly double by 2023, to 10.6%. In order to reap these outcomes, greater technology investments will be necessary.

Even amid the massive financial hurdles in the wake of the pandemic, a sizable majority of higher-ed respondents (75%) said they've invested in digital technologies and approaches to drive operational efficiency and cost savings.

But most (46%) have only seen small gains as a result of these investments, with just about one-quarter reporting moderate (15%) or large (13%) performance improvements (see Figure 3). Yet vast improvements are expected by 2023, with 56% expecting moderate or better efficiency gains.

Meanwhile, digital channels of revenue also loom large in the future of the higher-ed sector (see Figure 4, next page). While just 5.6% of revenues are derived through digital channels today, that figure is expected to nearly double by 2023, to 10.6%. In order to reap these outcomes, greater technology investments will be necessary. However, between now and 2023, higher-ed respondents expect the percent of revenue invested in technology to increase by only 3.5 percentage points (from 6% to 9.6%) — which is among the lowest of the industries we surveyed.

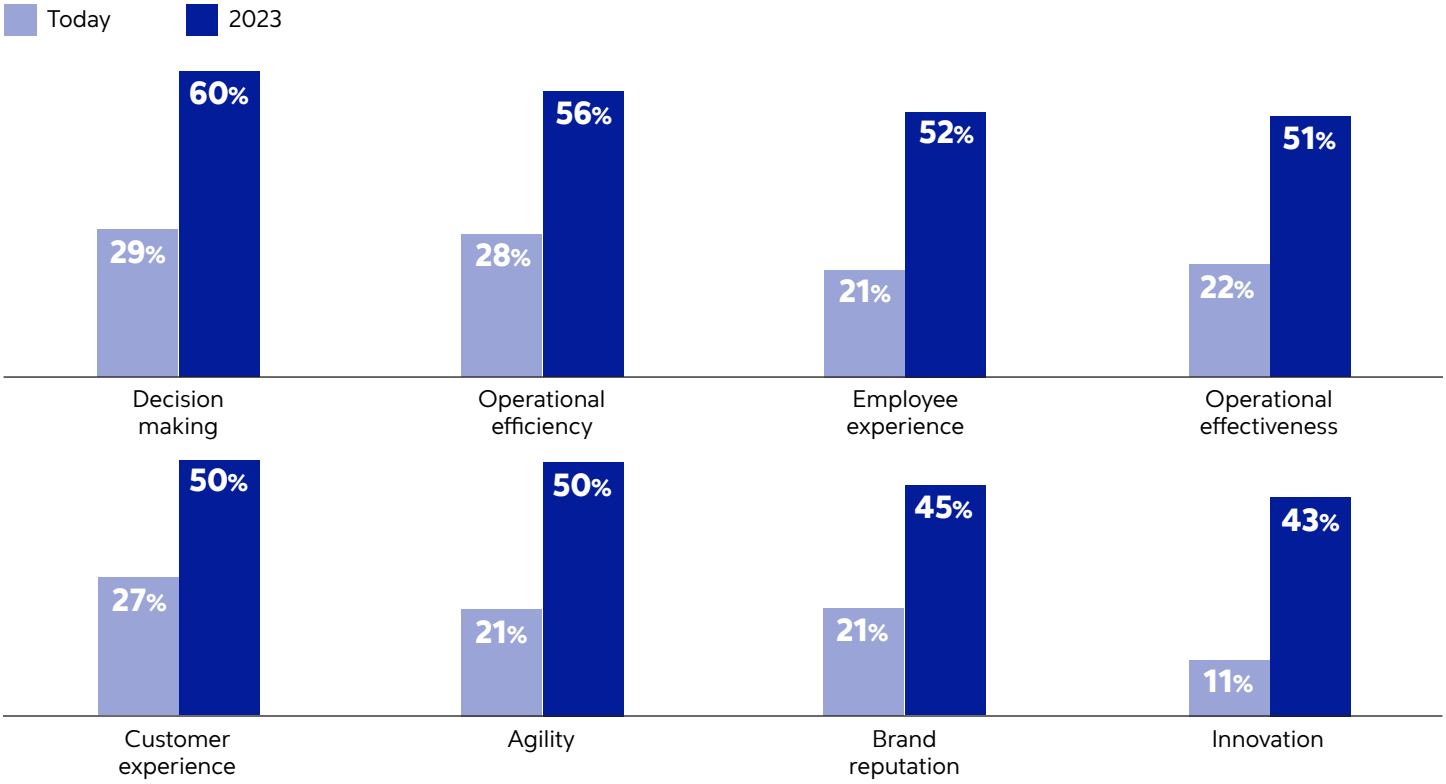
Investments will also be needed if higher-ed respondents are to win the apparent digital arms race ahead. When we asked respondents how they compare with their peers in terms of their use of digital, 60% believe they will be better than average by 2023 (although if they consult their math departments, they'll realize the illogic of this equation). This is especially pronounced in Europe, where perceived progress in competitive digital dominance is expected to more than double by 2023.

Breaking the status quo with AI & analytics

While higher-ed respondents were clear that AI and analytics will be crucial digital investments (and revenue generation engines), so far, just about one-third have deployed big

Outcomes start slow but grow

Respondents were asked what progress they expect as a result of applying digital technologies.
(Percent of respondents expecting moderate or large gains)

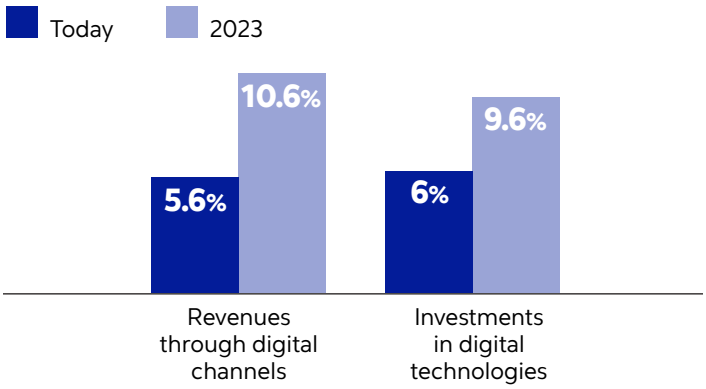


Response base: 285 higher-ed senior executives
Source: Cognizant Center for the Future of Work
Figure 3

data/business analytics or AI to some degree, and a larger percentage (over one-third) are at the pilot stage (see Figure 5). The proliferation of these increasingly sophisticated platforms will be driven by the continual generation of explosive quantities of data — lots of it — as inexhaustible fuel for algorithms and AI.

A digital disconnect

Respondents were asked what percent of their revenues would be derived through digital channels, as well as the percent of revenues invested in digital technologies. (Percent of revenues)



Response base: 285 higher-ed senior executives
Source: Cognizant Center for the Future of Work
Figure 4

While this will prove disruptive initially, it will help synthesize insights and learning across the traditionally disparate (and opaque) departments of most traditional universities. It's everyone's threat — but also everyone's opportunity.

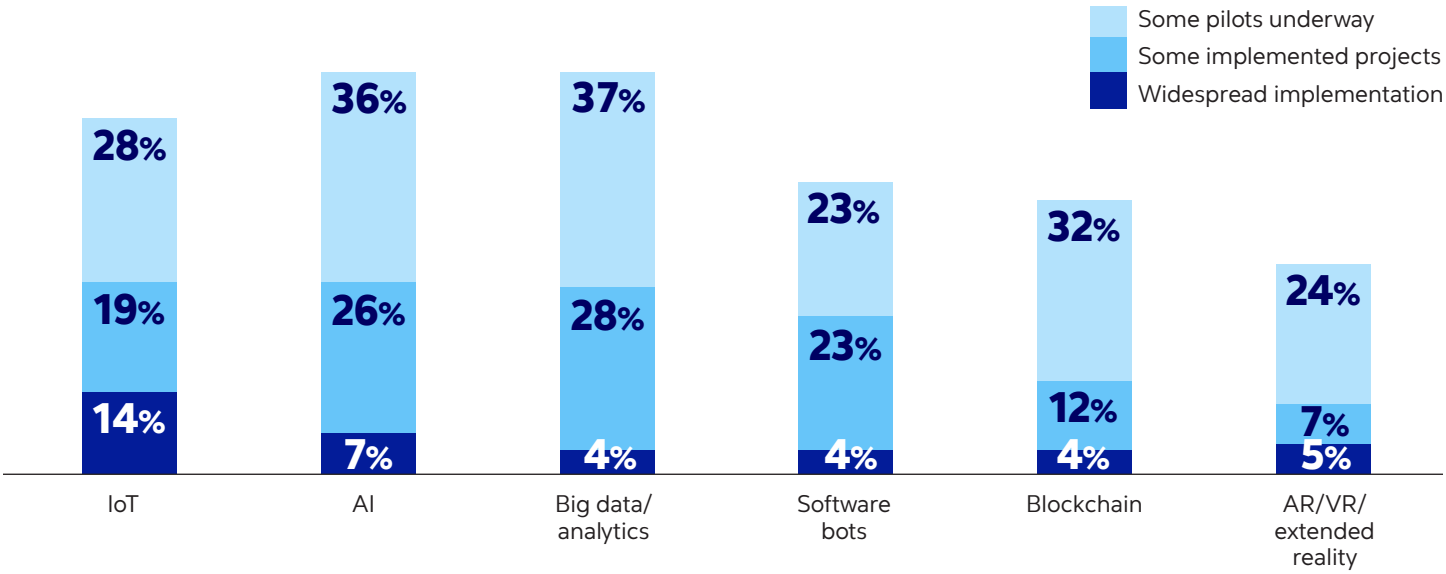
Surprisingly, the vast majority of higher-ed respondents (95%) have yet to widely deploy augmented, virtual and extended reality technologies. The reasons for this lackluster interest could be the prohibitive investments behind such technologies and the overhead associated with getting faculty support and comfort in a connected environment.

Yet the outsized impact and potential for these technologies are hard to ignore; for example, the University of Newcastle, Australia, co-innovated a virtual reality (VR) solution to transform critical neonatal training.[16] Additionally, the UK's first immersive virtual meeting and presentation experience has been rolled out at Oxford's Said Business School, called the Hub for International Virtual Education (or HIVE).[17]

Meanwhile, the private sector is using VR to quickly ramp up corporate learning and development initiatives for both learn-by-doing training and collaboration (as done by Strivr)[18] or apprenticeships (using platforms like Mursion[19]) to get employees productive — fast. (For more on this topic, see our report "**Launching into Virtual Space**.")

Top investment areas: IoT, AI, analytics

Respondents were asked about the progress made in implementing the following technologies to augment processes. (Percent of respondents)



Response base: 285 higher-ed senior executives
Source: Cognizant Center for the Future of Work
Figure 5

Skills shift as education evolves

Faculty will need to be educated on how AI and analytics can enhance their jobs and the student experience, and serve as a crucial partner in developing a more personalized approach to education that adapts to individual learning styles and needs.

Amid all the change in higher ed, one truth remains: The quality of education will always emanate from the faculty, whether the instruction is online or traditional. And as modes and models of education shift, higher-ed institutions will need to continuously track and deliver on the new skills needed among faculty.

It will be essential to train, support and immerse faculty in delivering an online educational experience. A major change management effort will be required to help professors accept and become adept at delivering learner-centric experiences that resemble what they would have traditionally delivered in-person.

Faculty will also need to be educated on how AI and analytics can enhance their jobs and the student experience, and serve as a crucial partner in developing a more personalized approach to education that adapts to individual learning styles and needs, anticipating and recommending the best path for what students need next. Because of the key role faculty and administrators play in the student experience, it's vital to equip them with the resources they need to deliver learning value that improves student retention.

These dynamics are clear in the skills higher-ed respondents believe will grow in importance between now and 2023 (see Figure 6). Learning and customer (student) care will take precedence among higher-ed institutions, moving from eighth and ninth place today, to third and fourth in 2023. These skills will be second only to communication and analytics skills, which retain their number one and two positions between today and 2023.

Top skills reflect the focus on the student experience

Respondents were asked to rate which skills had become more important than previously and which would become more important by 2023.

Today	IMPORTANCE	2023
Communication	1	Communication
Analytical	2	Analytical
Decision making	3	Learning
Leadership	4	Customer care
Innovation	5	Strategic thinking
Interpersonal skills	6	Decision making
Strategic thinking	7	Leadership
Customer care	8	Interpersonal
Learning	9	Innovation
Social media	10	Social media

Response base: 285 higher-ed senior executives
Source: Cognizant Center for the Future of Work
Figure 6

It's especially worthwhile to focus on the student experience in light of the growth in importance of customer care skills: Higher-ed institutions with mediocre programs and experience may fall by the wayside in coming years (and woe betide those "schools of hard knocks" whose experiences rate poorly).

In fact, student experience is just as important as education quality in cultivating strong learner outcomes. Again, this comes down to a personalized approach to education, from the moment the experience begins. This could extend from a transparent admissions process to when the student arrives on campus, making it easy to do everything from accessing information, to adding and dropping courses, to finding the dining hall that's serving her favorite meal that night. Students at risk of not passing a course or not graduating need personalized, interactive support in the moment to help turn things around. And when graduation approaches, a robust student experience would provide the tools and contacts needed to land their first job in the real world, as well as ongoing support and learning opportunities throughout their career.

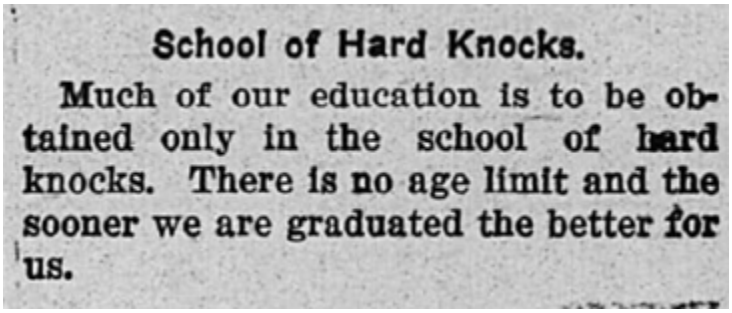
In the near future, many universities and colleges with solid reputations will use technology to pivot to a vastly wider audience and democratize their learning. This may involve partnering and/or co-branding with some of the biggest players in tech and using state-of-the-art digital tools (see Quick Take, next page).

To get there, higher-ed organizations will need to continuously rate and improve on their digital maturity across the spectrum of services they provide: student lifecycle management, academic services, university operations, institutional development and enterprise software infrastructure management and support.

We've been here before: New technologies, new ways of living, and new wealth and curiosity have historically impacted societies' relationships with education at times of great change. Thousands of years ago, the citizens of Athens paid the *sophistai* — wandering scholars who engaged in lecture halls, gave courses of instruction, and then moved on to other cities. (Fun fact: These same *sophistai* are the root of both our modern-day words "sophistication" and its pejorative kin, "sophistry.")

Fast-forward to the not-too-distant future when roles like "Uni4Life coordinators" may serve as modern-day equivalents of the *sophistai* of old, allowing trailblazing universities to offer lifetime learning for all alumni. Post-grads could then become lifelong learners who enjoy access to specially curated learning opportunities (and presumably fostering loyalty, reducing the cost of acquisition, and allowing them to spend for the privilege). (See our report "**21 More Jobs of the Future**" for more on Uni4Life coordinators and other emerging jobs in a time of analytics, automation and AI.)

Taking the long view, UNESCO's International Institute for Education Planning focuses on higher ed's role in supporting "flexible learning pathways." The institute is examining the processes for getting into, getting through and getting out of higher education at different life stages, and the effects on the students and the societies of which they are part.[20]


School of Hard Knocks.

Much of our education is to be obtained only in the school of hard knocks. There is no age limit and the sooner we are graduated the better for us.

An item appearing in the *Peninsula Enterprise* newspaper about the "School of Hard Knocks" (1918).

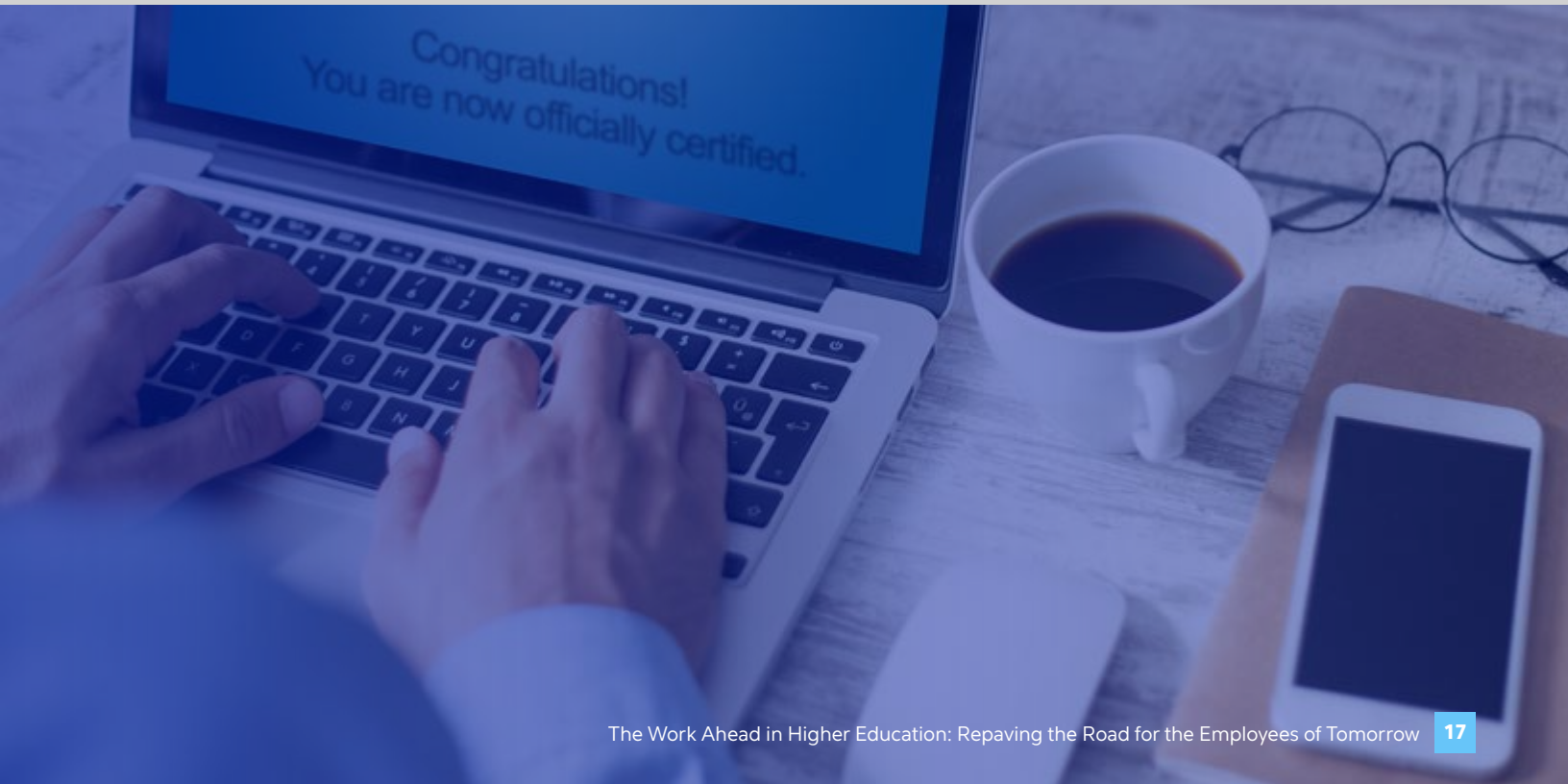
Quick Take

Tomorrow's 'digital grant' schools vs. yesterday's 'land grant' schools

What will a post-pandemic "new order" in higher ed look like? If past is prologue, consider: In 1947, because of the GI Bill, U.S. World War II veterans accounted for nearly half of all college admissions, and half of all World War II veterans participated in some form of education or job training with the benefits. Institutions like the University of California eventually burgeoned to 10 campuses, fueling degrees (and lifelong jobs) in new, post-war professions like materials science, nuclear engineering and swords-to-plowshares international development (and statecraft).

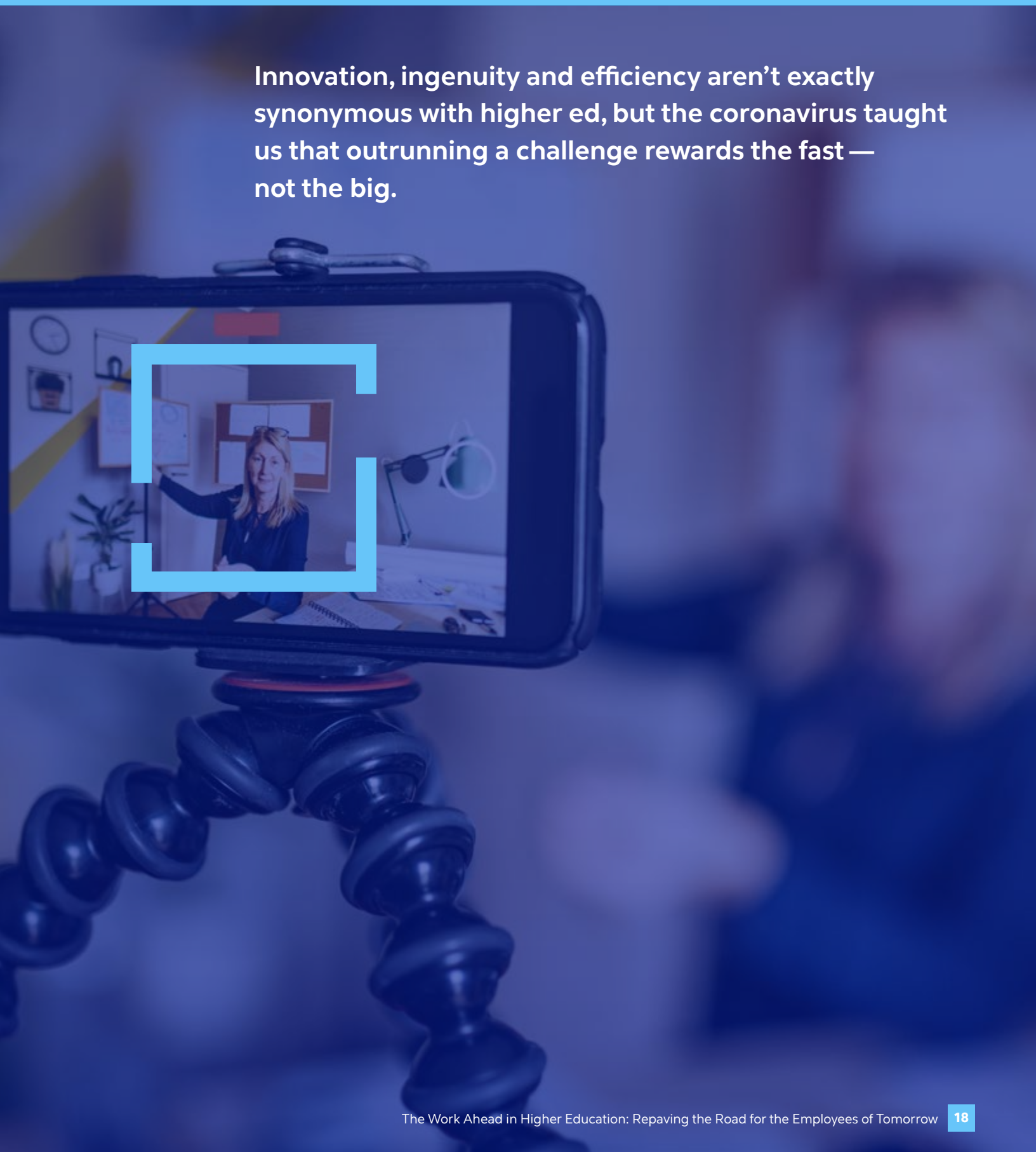
As a digital parallel to the land-grant colleges that launched U.S. flagships of higher ed after WWII or at the outset of the First Industrial Revolution, imagine if a Spotify-like "digital grant" ensued (recalling the impact that iTunesU had on MOOCs, for example), underwriting access to the highest quality distance-credentialing.[21] This could launch more affordable and faster credentials, tightly tuned with fluid employment markets and fine-tuned across career(s).

Micro-credentials can be useful not only for professionals but also for higher-ed staff, and can also complement the curriculum for students at bachelor, master and doctoral levels. High-quality, innovative and learner-centered education and training offered by universities and other education and training organizations could be enhanced through the flexibility that micro-credentials can offer.



The new ABCs of higher ed

Innovation, ingenuity and efficiency aren't exactly synonymous with higher ed, but the coronavirus taught us that outrunning a challenge rewards the fast — not the big.



In the wake of this watershed period, change is afoot, and being adaptive is critical work ahead. Let's face it: innovation, ingenuity and efficiency aren't exactly synonymous with higher ed, but the coronavirus taught us that outrunning a challenge rewards the fast — not the big.

Here are some critical steps higher-ed organizations can take:

- **Rethink relationship, remit and role.** Mastery of big data/analytics serves as a galvanizing prism through which every department — from economics, to electrical engineering, to history, to philosophy — at even the largest, most sprawling universities can rethink their relationships, remit and role relative to each other in view of coming changes wrought by advances in technology.
- **Use technology for better student/teacher ROI.** The biggest area of skepticism in our study is respondents' belief that technology will not enhance their ability to spend more time with family and friends. Does a growing sense of FUD (fear, uncertainty and doubt) around the future of tenure and the need for change (i.e., ROI, value-for-money and solving real-life problems) need to come at the expense of leisure time? Conversely, it's precisely the use of technology that will unshackle all participants from time-eroding drudgery, and allow for fresh insights to grow.
- **Rationalize digital revenue for digital value.** Digital offerings represent new pathways to engagement — and recurring revenue (i.e., Harvard Business School Online, Berkeley Global). But don't bet the brand if the offering's ROI isn't there. Additionally, it's an open question whether having "Harvard," "Oxford," "Cambridge," "INSEAD," "Stanford" or "Yale" on a LinkedIn profile conveys stature, positive "hustle" and a truly meaningful micro-credential or simply status inflation/exaggeration or worse: brand dilution for the university (giving new meaning to "earning a B.S.").
- **Strike a balance between machine-driven and human-centric work.** New platforms need constructing so that the most predictable, rote and repetitive tasks (i.e., administrative activities) are handed off to software, while instructors amplify their ability to teach. How humans and machines collaborate, and how they adapt to AI, is critical. As a result of this shared involvement, AI systems can learn to better proceed with new and unknown scenarios, while humans can continue to adapt and focus on higher-value tasks.
- **Coaching amplifies the human touch (with more technology).** We've long identified coaching skills as a central capability in the age of AI, algorithms and automation — specifically, helping people get better at everyday activities (managing their finances, managing their weight). Nowhere is this truer than in higher ed. For learning of tomorrow, it will be essential to combine the strengths of robots/AI software (accuracy, endurance, computation, speed, etc.) with the skills of humans (cognition, judgment, empathy, versatility, etc.). Humans can't do it alone — nor can intelligent machines. Technology is a means, not an end.

Shaking up the hallowed halls

Traditional higher-ed institutions need to make the shift from discrete learning into fast-evolving, tech-infused models. Reputation and location alone won't make them future-fit. (And with over 3,000 universities in the U.S. alone, what happens to those without the top-100 status or laurels of reputation to begin with?)

Big picture, no one wants to risk having the world's venerable colleges and universities become the next "Rust Belt." Urgent change and action are needed to imbue even the most ossified institutions with innovation and agility.

To prepare the next generation of workers for the very different jobs in the future of work will require institutions of higher education to adopt new models and heed lessons learned during the pandemic.

To prepare the next generation of workers for the very different jobs in the future of work will require institutions of higher education to adopt new models and heed lessons learned during the pandemic. Flexible and predictive approaches to skills identification and curriculum change, and digitally driven modes of education delivery — *this* is the work ahead.

Methodology

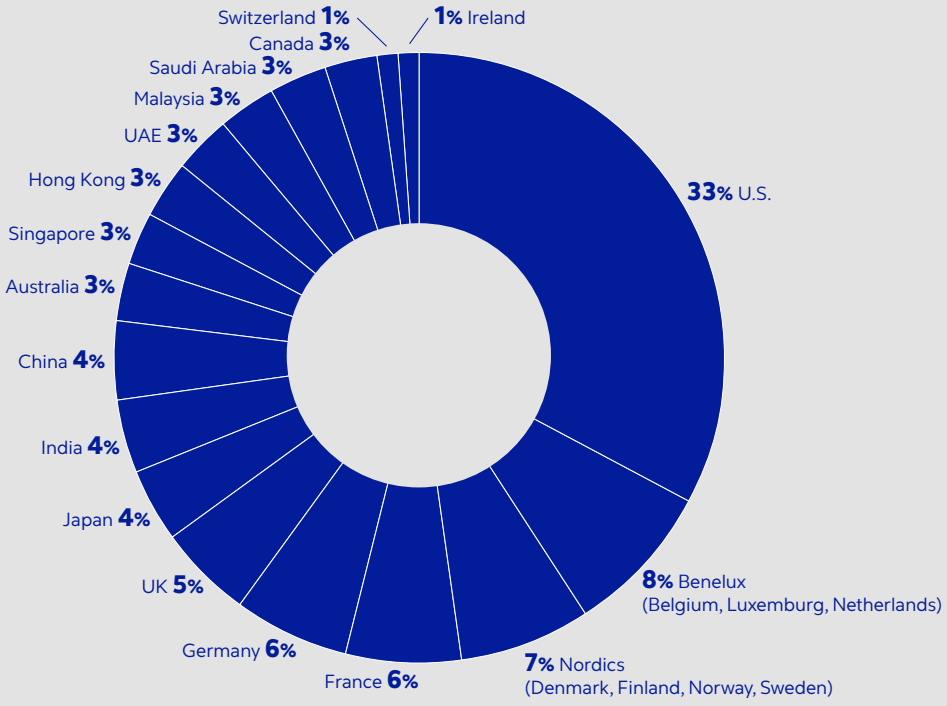
Cognizant commissioned Oxford Economics to design and conduct a study of 4,000 C-suite and senior executives, including 285 from the higher-ed sector. The survey was conducted between June 2020 and August 2020 via computer-assisted telephone interviewing (CATI). Approximately one-third of the questions were identical to those included in the 2016 Work Ahead study, allowing us to compare responses and track shifting attitudes toward technology and the future of work.

Respondents were from the U.S., Canada, UK, Ireland, France, Germany, Switzerland, Benelux (Belgium, Luxemburg, Netherlands), Nordics (Denmark, Finland, Norway, Sweden), Singapore, Australia, Malaysia, Japan, China, Hong Kong, India, Saudi Arabia and UAE. They represent 14 industries, evenly distributed across banking, consumer goods, education, healthcare (including both payers and providers), information services, insurance, life sciences, manufacturing, media and entertainment, oil and gas, retail, transportation and logistics, travel and hospitality, and utilities. All respondents come from organizations with over $250 million in revenue; one-third are from organizations with between $250 million and $499 million in revenue, one-third from organizations with between $500 million and $999 million in revenue, and one-third with $1 billion or more in revenue.

In addition to the quantitative survey, Oxford Economics conducted 30 in-depth interviews with executives across the countries and industries surveyed. Interviewees who responded to the survey have a track record of using emerging technology to augment business processes. The conversations covered the major themes in this report, providing real-life case studies on the challenges faced by businesses and the actions they are taking, at a time when the coronavirus pandemic was spreading around the world and companies were formulating their strategic responses. The resulting insights offer a variety of perspectives on the changing future of work.

The following figures represent the demographics of the 4,000 respondents from the full global study.

Respondents by geography



(Percentages may not equal 100% due to rounding)

Respondents by role

- **13%** Vice President
- **13%** Chief Operating Officer
- **13%** Director reporting to senior executive
- **13%** Senior Vice President
- **12%** President
- **12%** Chief Executive Officer
- **12%** Chief Financial Officer
- **12%** Other C-suite Officer

Endnotes

1 Netflix created a documentary of the 2019 college admissions bribery scandal in the U.S., entitled *Operation Varsity Blues: The College Admissions Scandal*.

2 Data from Statista: www.statista.com/statistics/184272/educational-attainment-of-college-diploma-or-higher-by-gender/.

3 Abigail Johnson Hess, "More than Half of Older Millennials with Student Debt Say Their Loans Weren't Worth It," Make It, April 8, 2021, www.cnbc.com/2021/04/08/older-millennials-with-student-debt-say-their-loans-werent-worth-it.html.

4 "Impact of the COVID-19 Pandemic on University Deferral Rates and Student Switching," London Economics, May 20, 2020, https://londoneconomics.co.uk/blog/publication/impact-of-the-covid-19-pandemic-on-university-deferral-rates-and-student-switching-may-2020/.

5 Richard Adams, "UK Universities Facing £760m Hit As One in Five Students Plan to Defer," *The Guardian*, May 20, 2020, www.theguardian.com/education/2020/may/20/uk-universities-facing-760m-hit-one-in-five-students-plan-defer.

6 Elissa Nadworny, "Fewer Students Are Going to College. Here's Why That Matters," NPR, Dec. 16, 2019, www.npr.org/2019/12/16/787909495/fewer-students-are-going-to-college-heres-why-that-matters.

7 Alexander Iosad, "Digital at the Core: A 2030 Strategy Framework for University Leaders," Emerge Education, www.jisc.ac.uk/guides/digital-strategy-framework-for-university-leaders.

8 Jake Nevins, "It's the Year 2120: MasterClass Is the Only School Left," *The New York Times*, May 25, 2020, www.nytimes.com/2020/05/25/style/masterclass-secrets.html.

9 Lyric by rapper Jay-Z from "Diamonds from Sierra Leone:" https://genius.com/Dc26-im-not-a-businessman-im-a-business-man-annotated.

10 Parmy Olson, "Building Brains: How Pearson Plans to Automate Education with AI," *Forbes*, Aug. 29, 2018, www.forbes.com/sites/parmyolson/2018/08/29/pearson-education-ai/?sh=29370b7a1833.

11 Douglas Belkin, "Is This the End of College As We Know It?" *The Wall Street Journal*, Nov. 12, 2020, www.wsj.com/articles/is-this-the-end-of-college-as-we-know-it-11605196909?mod=article_inline.

12 "Alert: Further Ransomware Attacks on the UK Education Sector by Cyber Criminals," National Cyber Security Centre, June 4, 2021, www.ncsc.gov.uk/news/alert-targeted-ransomware-attacks-on-uk-education-sector.

13 Strategic Education, Inc. website: www.strategiceducation.com/Employers/default.aspx.

14 John D. Stoll, "This College Degree Is Brought to You by Amazon," *The Wall Street Journal*, Nov. 9, 2020, www.wsj.com/articles/this-college-degree-is-brought-to-you-by-amazon-11604941263.

15 The University of Manchester website: www.manchester.ac.uk/discover/vision/.

16 Cognizant press release: https://news.cognizant.com/vrsolution-universityofnewcastle-jun8-2017.

17 "The Oxford HIVE," www.sbs.ox.ac.uk/about-us/venue-hire/park-end-street/oxford-hive.

18 "In the Footsteps of Trailblazers: How Walmart Embraces Immersive Learning," Strivr, www.strivr.com/resources/customers/walmart/.

19 Mursion website: www.mursion.com/.

20 UNESCO's website: www.iiep.unesco.org/en.

21 Lindsay McKenzie, "The End of the Line for iTunesU?" Inside Higher Ed, June 12, 2019, www.insidehighered.com/digital-learning/article/2019/06/12/apple-winds-down-itunes-u.

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Center for
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Cognizant's Center for the Future of Work™ is chartered to examine how work is changing, and will change, in response to the emergence of new technologies, new business practices and new workers. The Center provides original research and analysis of work trends and dynamics, and collaborates with a wide range of business, technology and academic thinkers about what the future of work will look like as technology changes so many aspects of our working lives. For more information, visit Cognizant.com/futureofwork or email CenterforFutureofWork@cognizant.com.

About Cognizant

Cognizant (Nasdaq-100: CTSH) engineers modern businesses. We help our clients modernize technology, reimagine processes and transform experiences so they can stay ahead in our fast-changing world. Together, we're improving everyday life. See how at www.cognizant.com or follow us @Cognizant.

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