

Relearning How We Learn, From the Campus to the Workplace

Businesses and educators know they need to prepare people for very different jobs in the future of work, but they're slow to revamp their education and training models, or collaborate with each other, according to our research. 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.

Foreword

No More Learning-As-Usual

The need to rethink how we learn has been an issue of growing importance for many years. In 2008, the late, great Clayton Christensen published *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*, laying out his vision for how every type of educational institution – from kindergarten to his then place of employment, Harvard Business School – would need to reshape itself for a hyper-connected world of hyper-personalized engagement.

That same year, the Khan Academy launched (and immediately became a beacon of how to use) modern digital tools to upgrade ancient practices. Stanford University computer science professor Sebastian Thrun launched Udacity soon thereafter, following a revelation that the highest performing student in his class only ranked 148th when he made course work and an associated exam available online to anyone and everyone.

Fast-forward to 2020. Many schools and colleges around the world are developing and experimenting with unique approaches that replace the physical with the virtual or – even better – meld them into a more potent learning environment. Sadly, few have really scaled or stuck. The reason? Much as forward-looking thinkers could see disruption coming, the vested interests of *business as usual* were too great, and the threat of disruption – to those doing very nicely, thank you – too peripheral and too distant to deliver a meaningful leap for learning.

Unprecedented change and an existential challenge

That has all changed. The coronavirus and ensuing lockdown currently in effect means that rethinking education is no longer something for a fun offsite in a nice hotel at the end of the semester, but an existential challenge to every dean and president and headmaster and principal around the world. Right now.

Schools and universities are shuttered. Exams are canceled. Layoffs of professors and teachers will inevitably follow.

“Brand-name” schools – like Christensen’s *alma mater* – will, in time, bounce back. Many other less prestigious places will never reopen their doors.

At this moment of extreme peril, and in the spirit of turning crisis into opportunity, educators and administrators at every scholastic level – and those responsible for training employees in the wider workforce – must urgently reassess their existing practices and protocols. They need to reimagine how to operate in a world of remote presence, social distancing and considerable economic stress.

Will a state school in the U.S. be able to charge out-of-state parents \$50,000 a year for a virtual class in the future? *Unlikely*. Will a private liberal arts college be able to charge \$70,000 to parents whose 401K has cratered and who now face years of a new great depression? *Extremely unlikely*. Will an employer struggling under a government bailout debt repayment burden be keen to spend millions of dollars for its employees to learn C++ or Python? *Probably not*.


Forging the future of education

The coronavirus poses a new, unexpected and unprecedented challenge to all those involved in education. In this recently published report *Relearning How We Learn, From the Campus to the Workplace*, we lay out a series of ideas and recommendations that can help educators think through what needs to be done. Today.

Ideas that may have seemed trivial or “silly” are now a route to survival. Changes that may seem too radical or unthinkable should now be regarded as serious options for serious people. As politicians and policy makers globally grapple with the steps that must be taken to deal with a new “war,” education leaders must similarly make decisions of a scale that will reverberate for generations. Positively or negatively.

As Clayton Christensen knew only too well, when disruptions come, *they come not single spies*, as Shakespeare would say. Dealing with this moment of disruption – a pandemic and an economic meltdown – will require those in the hot seat to act swiftly and boldly. And with foresight. This report charts the terrain ahead.

The coronavirus and ensuing lockdown means that rethinking education is now an existential challenge to every dean and president and headmaster and principal around the world. **Right now.**

A person with curly hair and glasses is shown from the side, wearing a blue long-sleeved shirt. They are using a laptop. Their right arm is a prosthetic, with a dark, segmented design and multiple fingers. The background is a blurred office or lab setting with shelves and equipment. The entire image has a blue tint.

Cognizant's Center for the Future of Work surveyed top businesses and higher education institutions globally to gain insight into the changes these entities are making in their training and educational programs, and the challenges they face in preparing tomorrow's workforce.

Executive Summary

Whether you work in the front office, back office or the C-suite, you'll soon need to know how to collaborate with artificial intelligence (AI) systems. Indeed, the rise of automation and AI is raising questions about the employable skills, attitudes and behaviors necessary for people to participate in the future of work. While automation will eliminate some jobs, many more will be created or changed. For instance, welders, joiners and mechanics at German auto-parts maker Bosch have been trained in basic coding skills so they can use robots to assist them in their work.¹

Whether these changes proceed rapidly or at a moderate pace, many individuals will need to adapt to changing work tasks or switch to new occupations entirely, while many students will need to point themselves in multiple career directions. Unfortunately, according to our recent research, both business leaders and educators have been slow to adapt their corporate learning programs and educational approaches to reflect the future of work, with most at the early stages of identifying future skills. Worse, rather than shouldering responsibility for preparing individuals for the future of work, businesses and higher education institutions (HEI) appear to be pointing their fingers at each other.

In the face of the unknown future, businesses and HEIs will need to engage in more flexible partnerships, quicker responses, different modes of delivery and new combined-skill programs to reliably prepare people for what comes next. Crucial questions include: How will we identify the most relevant skill areas? How can we overhaul our content and curriculum? How can we redefine our teaching and training approaches?

To answer these questions, Cognizant's Center for the Future of Work surveyed 601 top business executives at leading companies and 262 higher education institutions, globally. Our objective was to gain insight into the changes these entities are making in their educational programs, and the challenges they face in preparing tomorrow's workforce. (For the full study methodology, see page 26.)

Based on our findings, we've developed a future of learning equation that incorporates the elements of change required: skills identification, overhauled approaches to content/curriculum and training/teaching, and an environment supportive of self-learning. The speed at which these elements are executed will determine how effectively businesses ultimately navigate the rocky path of preparing a workforce fit for the future of work.

Key findings

Our research reveals the following key trends, the impacts of which will soon ripple throughout businesses and across the higher education industry:

- I Preparing the workforce for future jobs is a matter of survival for both businesses and HEIs.** The majority of businesses (80%) and HEIs (72%) agree it's extremely important to prepare workers and students to work alongside emerging digital technologies. They have a mammoth task ahead, though: Businesses and HEIs estimate that 62% and 57% of their total staff and students, respectively, (up from only about one-quarter today) will be prepared to handle new types of work driven by emerging digital technologies in the next five years.
- I Breaking down the status quo is a tall order for HEIs.** Many HEI respondents (84%) expressed concern about meeting the challenge of preparing the future workforce, particularly when it comes to delivering learning with greater speed, agility and flexibility, compared with 58% of business respondents.
- I HEIs need to get onboard with the need for human skills.** While businesses and HEIs are aligned on the need to provide programs for AI/robotics and related ethics skills, there's a disconnect on how they view the importance of attendant human skills, with just 46% of HEIs considering these important, compared with 80% of businesses. Future jobs will require a combination of human and technological capabilities, as will the educational systems preparing future workforces for these roles.
- I Businesses are beginning to bear the burden of learning.** Skills have become like mobile apps that need frequent upgrades. While 43% of businesses currently update their learning content on an annual or biennial basis, 71% of HEIs only update their curriculum every two to six years. Businesses are intent on speeding the pace of curriculum updates, with 75% planning to move to a one- to five-month or even continuous refresh schedule in the next five years. In contrast, only 30% of HEIs plan to increase update frequency, from today's two- to six-year cycle to an annual one by 2023.
- I Emerging technologies such as AR/VR and AI will supercharge learning by focusing on "how to learn" over "what to learn".** New modes of education delivery will emerge, with Netflix-style, on-demand digital assets allowing for anytime, anywhere self-learning. AI-driven learning platforms will personalize learning, and augmented/virtual reality (AR/VR) systems will become mainstream, with a 220% increase in the take-up of the technology by HEIs and businesses in the next five years.
- I Curation will supersede creation:** To enable more continuous content updates, businesses and HEIs will need to see themselves as curators rather than creators of content. Already, 62% of business leaders agreed they need to move from a "we create content" to a "we curate content" mindset in order to deliver timely learning materials relevant to employees' needs.
- I The work ahead means working together.** Preparing the current and future workforce for the work ahead cannot take place in a vacuum. Three-quarters of both businesses and HEIs view collaboration as critical to successfully managing the transformative and disruptive impact of the new machine age.

PREPARING FOR THE FUTURE OF WORK IS EVERYONE'S JOB

The well-known adage “people are our most important asset” holds more weight than ever today. Not only do companies and HEIs need to train people for jobs that currently exist, they also need to prepare them for jobs that don’t exist yet. As a recent World Economic Forum report points out, more than 35% of today’s important job skills will have changed by 2020.²

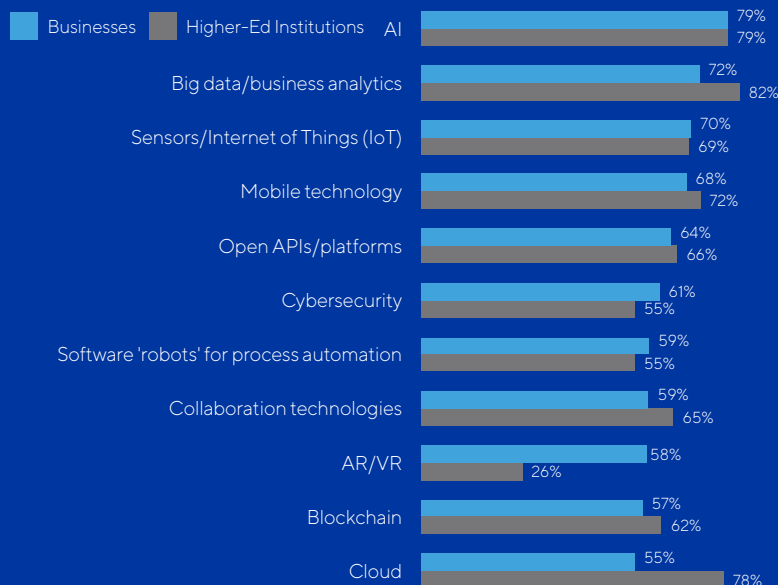
Jobs of the future will be defined by the new tools of the trade (i.e., AI, AR/VR, big data, IoT), which respondents believe will have a significant impact on work in the next five years (see Figure 1). Automation and AI will increasingly take over not just routine, repetitive and low-end tasks, but also highly skilled white-collar work, making some people’s skills and capabilities irrelevant, and leaving behind those unable to keep up. Of the businesses surveyed, 76% are already confronting a daunting talent gap, and 73% feel the skills gap will widen in the next five years.

Most companies (81%) believe in reskilling workers whose roles, whether in whole or in part, have been automated. In fact, 73% of companies agreed they will lose ground to competitors if they don’t reskill their people. Insurer Aviva, for example, recently released a note to its 16,000 workers in the UK saying, “If you think your job could be automated, we want to know. If we agree, we’ll retrain you for another role at the firm.”³ Not only will this type of strategy seal employees’ trust, but it will likely provide a competitive advantage over slower-moving businesses that try to find scarce talent externally.

AT&T has initiated a massive reskilling effort after determining that nearly half of its 250,000 employees lacked the necessary science, engineering, technology and math (STEM) skills needed to keep the company

All hands on deck

Respondents were asked to rate the impact of the following technologies on work in the next five years. (Percent of respondents answering “somewhat significant” or “significant” impact).



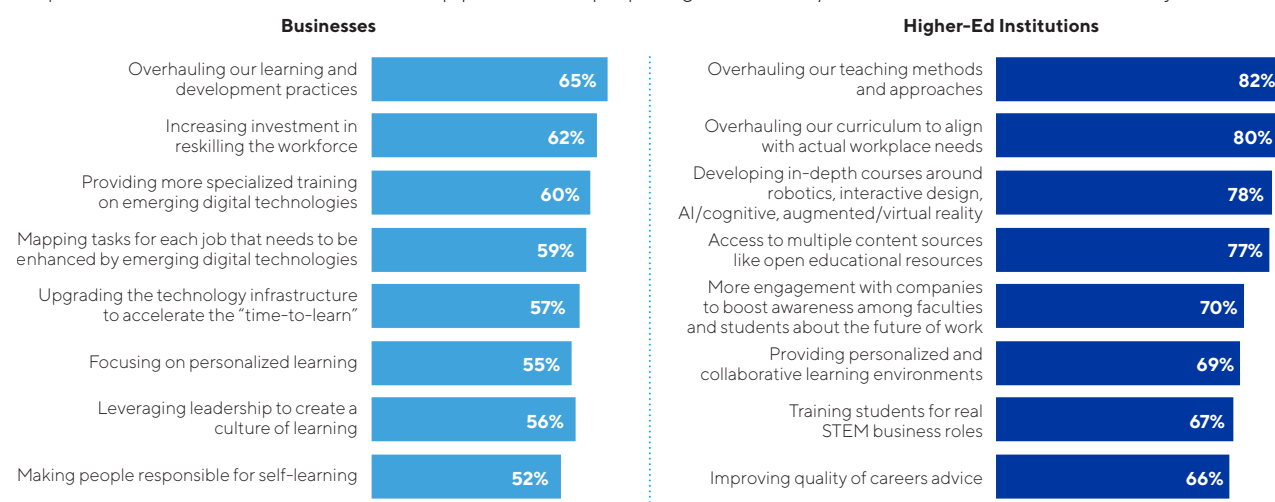
A higher percentage of businesses than higher-ed institutions said it was somewhat important or very important to upskill and reskill the workforce or equip students with the necessary skills and abilities for new types of work driven by emerging digital technologies.



Source: Cognizant Center for the Future of Work
Figure 1

Refueling learning programs for a better future

Respondents were asked to name their top priorities for preparing the current/future workforce in the next five years.



Source: Cognizant Center for the Future of Work
Figure 2

competitive. The initiative is a \$1 billion web-based, multiyear effort that includes online courses; collaborations with Coursera, Udacity and leading universities; and a career center that allows employees to identify and train for the kinds of jobs the company needs today and down the road.⁴ In short, it will be critical to their survival for the workforce to learn to handle the work driven by emerging digital technologies.

Message received, loud and clear

While there is clearly no one-size-fits-all approach for preparing the workforce of the future, companies and HEIs agree: They must identify skills of the future, and overhaul existing curriculum and associated learning and teaching approaches to develop those skills or be left behind (see Figure 2).

Business leaders and educators have a mammoth task ahead. Today, businesses and HEIs estimate that only about one-quarter of their total staff and students (27% and 20%, respectively) have the skill base to work and interact with emerging digital technologies. This figure is expected to more than double (to 62% for companies and 57% for HEIs) in the next five years. Consequently, more frequent reskilling will become the new norm as businesses move from annual reskilling programs (45%) to reskilling the workforce every one to two months, fortnightly or continuously (65%). To get there, nearly 60% of businesses plan to undergo an organizational realignment and change management program in the next 12 to 24 months to promote learning.

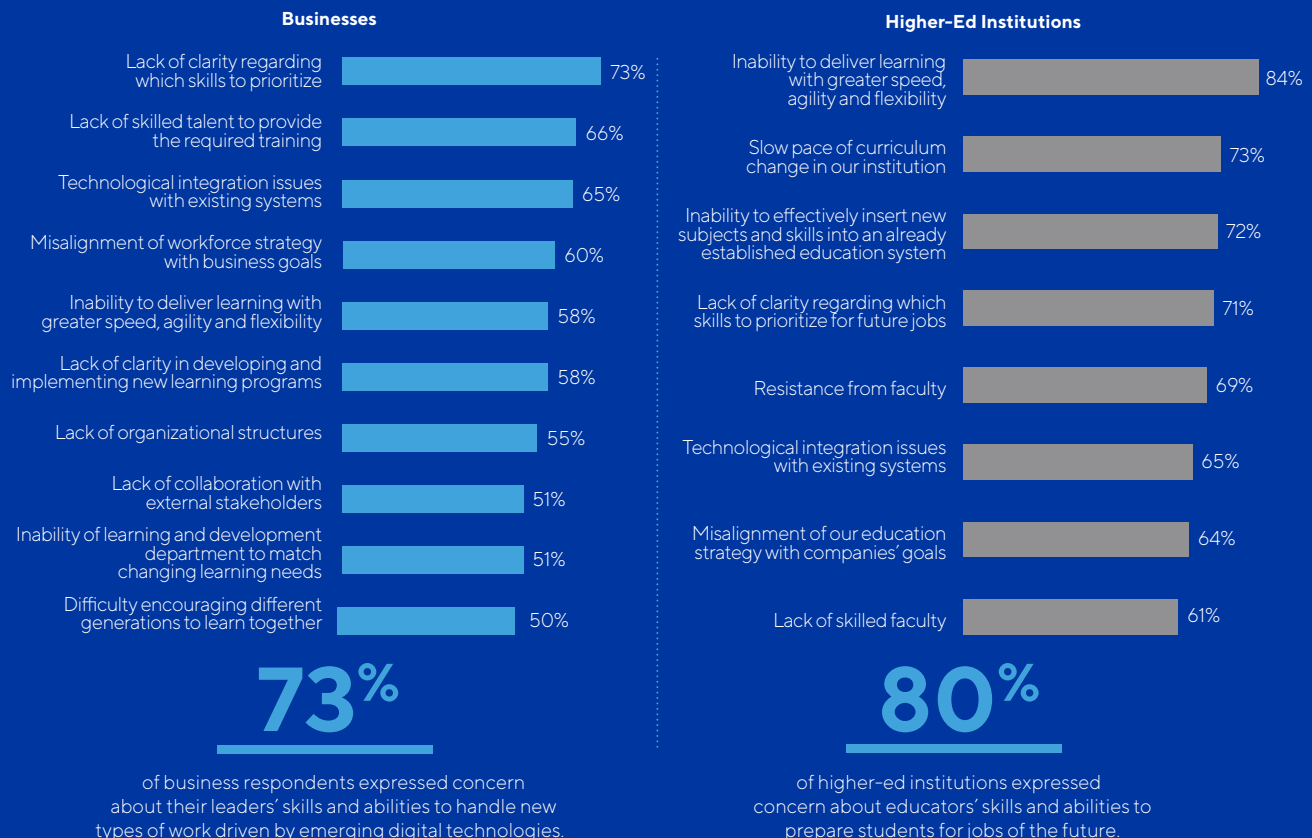
Realistically, this type of overhaul will take time, practice, effort and lots of resources, a reality that has not escaped respondents' attention; 62% of businesses stated that increasing investment in this space is a top priority. While businesses currently invest just 2.1% of their total annual revenue on workforce training/learning, on average, that will nearly double to 4% in five years.

As evidence that reskilling is becoming a bigger business priority, the metrics that will be used to measure the effectiveness of their efforts will focus on business performance, including improved business operations (80%) and reduced human error (77%). To maximize returns on their investments, the majority of business respondents (72%) plan to link employee performance metrics with the new initiatives to hold employees accountable for what they've learned.

Most of the resources expended by HEIs are directed toward efficient delivery of education (digital delivery, infrastructure upgrades, etc.). While these are all necessary investments, 73% of HEI respondents agreed there's an urgent need to teach the right things first – which means identifying the gaps faced by enterprises and re-building programs that address these gaps immediately. The earlier linear model of education-employment-career will no longer be sufficient. Making future jobs preparation an education priority will require transformations that are every bit as dramatic as those that came about in the early part of the 20th century.

Top challenges for skilling and reskilling the workforce

Respondents were asked to name the top challenges that could impact their priorities in preparing the current/future workforce.



Source: Cognizant Center for the Future of Work
Figure 3

Preparing for a sea change in learning

Compared with business respondents, HEIs seem to be responding more slowly to the rapid technological and social changes. The challenges anticipated by business respondents – finding qualified trainers and integrating new learning systems with old ones – are practical in nature, whereas the issues cited by HEI respondents – which involve challenging old assumptions and upsetting entrenched routines – may be more difficult to overcome (see Figure 3, previous page). The longstanding educational models that prioritized standardization and stability will soon be supplemented, if not replaced, with new education models offered by nontraditional competitors that embrace organizational innovation, responsiveness and agility. Many of our HEI respondents expressed concern about being able to live up to the challenge.

Both businesses and HEIs need to address these challenges proactively:

- I Will the real leaders and educators please stand up?** Within our survey, 73% of businesses said they're concerned about their leaders' abilities and skills to handle new work introduced through digital technologies. In HEIs, 80% of respondents were concerned about their educators' ability to prepare students for new technologies. If our leaders and educators aren't currently equipped to understand and train people on the skills required in the coming machine age, how can we expect our workers and students to adapt? Creating a culture of learning is one of the top priorities of learning and development (L&D) teams, but it won't happen unless leaders fix their own "learning quotient." Failing to do so will not only limit leaders' own growth but also put the talent supply chain at risk as smart employees flee to companies with more robust learning environments.
- I Make learning a boardroom priority.** Misalignment of workforce strategy with business goals was cited as a top challenge. In fact, 60% of businesses agreed that learning is still perceived as departmentally-driven and, as such, is the responsibility of the L&D and/or HR departments – business functions that are not always the driver of change in businesses. With so much at stake, it's essential for learning to move from a watercooler topic to a key agenda point for boardroom discussions so that concrete decisions can be made.
- I Retrain the trainers and their learning systems to work like pilots and auto-pilots.** Just as the role of pilots has shifted from flying a plane to monitoring auto-pilot systems and intervening as and when required, the role of L&D professionals will move from being a "controller" of learning systems to a "facilitator" of learning. Learning management systems (LMS) also need to change, from primarily dictating what learners need to learn, to letting learners decide what they want to learn and guiding them accordingly. Sensing this gap, Amazon Web Services (AWS), for example, is building ready-to-use learning platforms for individuals to engage with content such as videos to gain skills, with managers tracking their progress.⁵

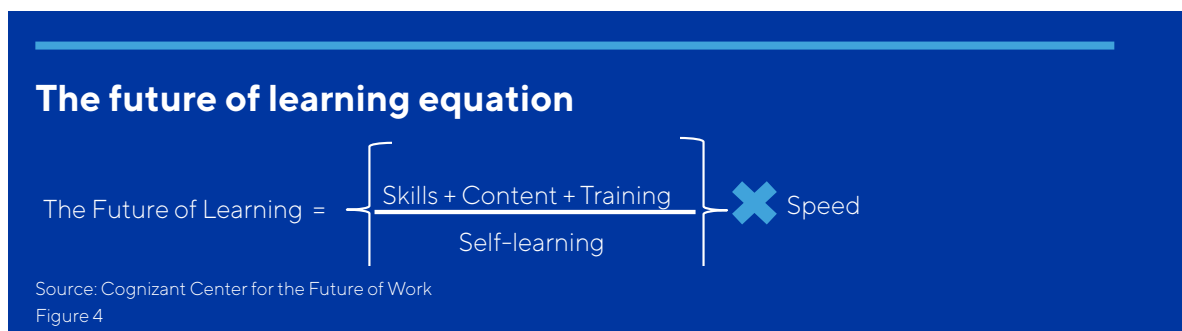
THE FUTURE OF LEARNING: BREAKING DOWN OLD RULES, WRITING NEW ONES

Among business respondents, 64% believe work will be intertwined with learning in the future as people adopt new skills to align with employment opportunities.

The signs are clear that change is upon us: Among business respondents, 64% believe work will be intertwined with learning in the future as people adopt new skills to align with employment opportunities. Businesses and HEIs need to adapt their content/curricula and training/teaching to the needs of learners and the job market.

In order to facilitate these changes, we've developed a future of learning equation (see Figure 4) that helps entities fundamentally redesign their learning processes and structures by responding to the changes needed to equip people for the work ahead. Bringing these practices to scale will require businesses and HEIs to perform the following steps:

- Identify skills required for future jobs.
- Curate flexible and adaptive learning content that is updated continuously to allow learners to rapidly acquire new skills.
- Embrace new forms of teaching and training (from instructor-led, to AI-driven and AR/VR-adapted, for instance) to increase learning effectiveness.



At the heart of the future of learning are the compressed timeframes in which the workforce needs to be continuously skilled and reskilled, content needs to be curated, and training needs to occur. Considering this, the goal of the future of learning equation is to spur companies and educational institutions to keep up with the skills and knowledge needed for the future of work by continuously adapting workforce capabilities. Ultimately, in order for the future of learning to function effectively, it must be supported with self-learning.

Skills: turning humans and machines into collaborative colleagues

Although the "skills landscape" has never been as complex and important as it is today, the majority of HEIs (72%) and businesses (56%) are still in the process of identifying future skills. Businesses are further ahead, with 41% of respondents identifying and building future skills in parallel, compared with only 26% of HEIs doing so.

Demand for certain skills will decline, while others will grow in importance (see Figure 5, next page). While businesses and HEIs seem to agree on the importance of AI/robotics, technical and ethics skills, HEIs seem less concerned than their business peers about the need for soft ("human") and business skills. We found the greatest areas of alignment and misalignment between business leaders and educators included the following:

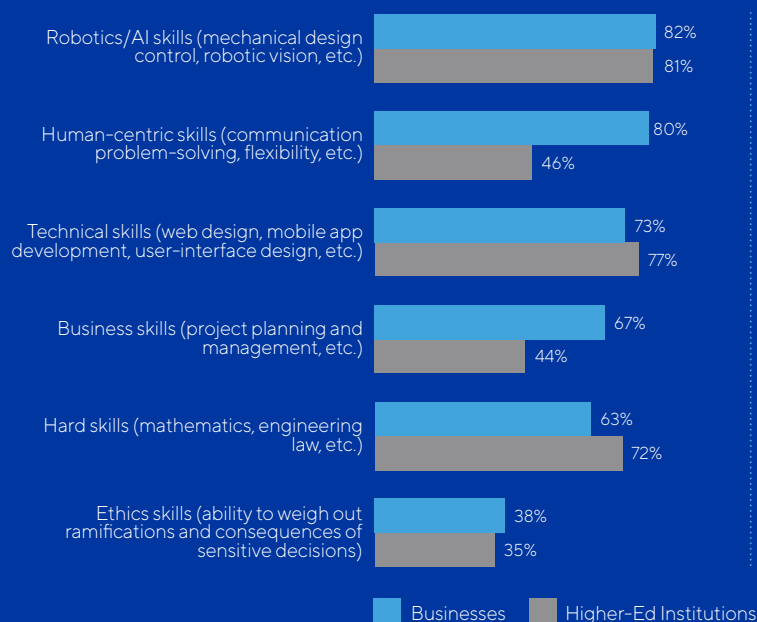
- Skills that make humans more human.** As the future of work unfolds, what makes us human is what will make us employable. Companies are increasingly placing a premium on job applicants who demonstrate skills like flexibility, self-motivation, empathy, resilience, creativity and communication capabilities, as they know “humanness” will become a competitive advantage when working with intelligent systems.⁶

In our study, while 80% of business respondents said the importance of human skills will be critical in the future, only 46% of HEIs agreed. We think this is because HEIs primarily view their role as a knowledge provider and believe human skills should be enhanced on the job. In reality, future jobs will require a combination of human and technological capabilities, as will the educational systems preparing the future workforce for these roles. For instance, even big data and data science jobs are more likely to demand creativity, teamwork, research and writing skills than other jobs.⁷ HEIs that don’t consider real-world contexts can’t help students develop the competencies and dispositions they need to be successful.

- Robotics/AI skills to work intimately with intelligent systems.** Business leaders and educators agree that AI/robotics skills will be critical in the future. However, not every individual will need to become a machine language expert. We believe two types of AI skills will emerge in the future: skills to build machines, and skills to collaborate with them. While the former is meant for people who want to build their career in robotics/AI, the latter will involve every worker getting familiarized with AI systems by learning basic technical constructions, and tweaking machine capabilities to exploit the full value of the system.

Which skills should be prioritized?

Respondents were asked which types of skills would be most important in the future as emerging digital technologies change the nature of work.



A somewhat greater percentage of HEI respondents said students with STEM backgrounds would be best prepared for future jobs.



Source: Cognizant Center for the Future of Work
Figure 5

Both businesses and HEIs believe ethics will be important for the future of work, highlighting a partnership opportunity to train people on defining tasks for intelligent machines and what to do when they don't execute as expected.

At Singapore's Changi Airport Terminal 4, for instance, jobs did not disappear when the airport implemented facial recognition capabilities in its automated check-in and boarding systems, and high-resolution X-ray into its baggage checks. Instead, the nature of jobs has changed. Airport staff now spend more time guiding and assisting travelers, as well as attending to and overseeing the automated machines.⁸

AI/robotics are becoming disciplines in themselves and are emerging as majors, minors, areas of emphasis, certificate programs and courses in many colleges and universities. We believe these courses need to be complemented with problem-solving components in order to produce workers who can use technology to address real-world problems.

- I Ethics to build trust with AI systems.** Both businesses and HEIs believe ethics will be important for the future of work. Machines being built today are unlike any built before, and nobody knows the possible unknown consequences that could result from intelligent machine failures or mishaps. There will be a need for highly-skilled professionals to ensure the integrity, security, objectivity and proper use of intelligent machines. This hasn't escape the notice of HEIs, with 61% of HEI respondents saying they were prioritizing the introduction of new curricula on topics such as ethics and trust associated with intelligent machines. Incidentally, this highlights a great partnership opportunity for businesses and HEIs to train engineers, designers, developers and innovators to not only define specific tasks for intelligent machines, but also determine what to do when they are not executed as expected.
- I The need to tweak STEM education.** Both business leaders and educators concur that STEM courses will continue to provide a solid foundation to students for future jobs. However, HEIs need to supplement their STEM streams with design thinking, entrepreneurship, creativity and social science skills. When Google analyzed its hiring, firing and promotion data, for example, it found that among the eight most important traits of the company's top employees, STEM expertise was dead last. The seven top characteristics of successful Google employees were all human-centric: being a good coach, communicating and listening well, having empathy and being a good critical thinker, among others.⁹

Content: from static to dynamic

Businesses and HEIs will be unable to foster required new skills without a major curriculum and content overhaul – as well as a new approach to delivery that is on-demand and continuous in nature. One of our most prominent research findings is that businesses seem much more prepared than HEIs to provide the required dynamic content and learning strategies. While 43% of businesses currently update their learning content on an annual or biennial basis, 71% of HEI respondents only update their curriculum every two to six years (see Figure 6, next page). By 2023, 75% of businesses plan to update their learning content every one to five months, or on a continuous basis, while only 30% of HEIs plan to overhaul their curriculum on an annual basis. As a result, crucial learning may shift toward the workplace as the curriculum at HEIs becomes too outdated to prepare students for the future of work.

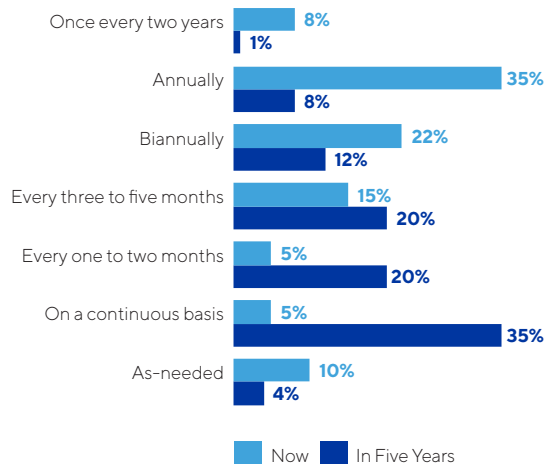
The following dynamics will transform the roles of L&D teams and educators in content preparation:

- I Stop creating, start curating.** To enable more continuous content updates, businesses and HEIs will need to see themselves more as curators of content rather than creators of content. Already, 62% of business respondents agree they have to move from a “we create content” to a “we curate content” mindset in order to deliver timely learning materials that are relevant to employees’ needs. The proliferation of content from massive, open online courses (MOOCs) (e.g., Coursera, Udacity, Iversity, etc.) or other free open-learning content (TED, iTunes, MIT, etc.) provides an immense opportunity for corporate L&D teams to benefit from already-created content.
- I Skill-based curriculum is no longer a choice.** One of the biggest challenges facing HEIs today is developing curriculum that is fit for both current and future jobs. Sixty-seven percent of HEI respondents strongly felt the need to overhaul their curriculum to align with actual workplace needs, and 73% believe the use of predictive analytics to forecast workforce needs and create relevant programs would be a good strategy to get there. In the U.S., Northeastern University recently employed analytics tools to identify emerging and growing job market needs and high-growth degree areas. With real-time data, the university has moved forward with more than a dozen new and revised programs, including degrees and certifications in data science and nanotechnology. The analysis also helps the university develop its curriculum by detailing skills required within each sector.¹⁰

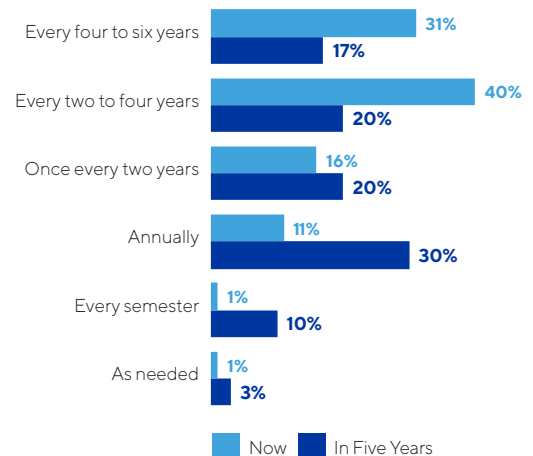
Another way HEIs can address the curriculum issue is by complementing traditional degrees with

Businesses more prepared for dynamic content than HEIs

Business respondents were asked how frequently their organization updated its learning content based on current needs and future requirements, now and in five years



HEI respondents were asked how frequently their institution updated its core curriculum to adapt to changing business environments, now and in five years.



A majority of respondents believe badges and certifications will outweigh degrees in the future

Businesses 80% Higher-Ed Institutions 72%

Source: Cognizant Center for the Future of Work
Figure 6

badges and certifications from employers. For example, 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 soft skills. California's community colleges are running employer-verified programs that offer digital badges to students and workers for critical human skills such as adaptability, an analysis/solution mindset and resilience.¹¹

- I **Textbooks will go Netflix.** Students today learn differently from how their parents did. In a digital-only world, they will expect content that responds to them. Pearson Education, an educational publishing company, allows students to pay for a semester-long subscription to its software 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.¹² AI-driven hyperpersonalization can help determine shortcomings and steer students to content that can quickly provide remedial help and mastery over time.

Training: invisible, immersive and personalized

The future of learning will be not only about content but also how it's delivered. In fact, 81% of HEI respondents agreed they need to change their teaching methods, and 75% said they need to focus on teaching students "how to learn" instead of just "what to learn." Tomorrow's learning experience will be more active, interactive and frictionless, and take place in an environment that blurs the boundaries between the traditional classroom and the world outside of it. A thoughtful combination of approaches will allow business leaders and educators to capture and reinforce deeper learning:

- I **AR/VR will make learning immersive.** There's a strong need to expose learners to a wide range of realistic experiences to make them adaptive to various situations at work. Our data revealed tremendous interest from both businesses and HEIs in leveraging AR/VR to transform teaching methods over



the next five years. For example, VR-led training in diversity, inclusion and empathy lets employees experience the workplace in someone else's shoes. Interestingly, Fidelity Investments chose empathy-building as its first employee VR training program for call center associates geared toward helping agents try out more compassionate responses to customers.¹³

By applying AR/VR technology to education, anything is possible: a room full of history students exploring the wreck of the Titanic, a group of medical students opening a heart to improve their comprehension, a class of astronomical students landing on the moon as astronauts. In fact, AR/VR can help HEIs address the current disconnect they face with human-centric skills by providing students with an environment to not just learn but also test out human-centric skills they need to be successful, while educators build curricula based on the real-world challenges provided by AR/VR learning experiences. (For more on this topic, see our recent report ["Bringing Learning to Life through Immersive Experiences."](#)¹⁴)

I Face-to-face training will become a thing of the past, at least for businesses. While instructor-led, face-to-face training is still the number-one approach followed by businesses today, this technique will be reduced significantly in the next five years in favor of virtual training, e-learning and other online media (see Figure 7, next page). Bank of America Merrill Lynch has already made the switch to all-digital learning (video, mobile, blended, etc.) for its employees, reducing the use of face-to-face learning to 25% (down from 100%) in favor of a learner-chosen model.¹⁵ In contrast, face-to-face training continues to be the main focus for HEIs, with 70% of institutions citing organizational resistance as the key reason for the lack of change in training techniques. As a result, 55% of HEIs said they plan to change faculty profiles to effectively address the needs of the next-generation learner.

I AI is the next giant leap in personalized training (and learning). Both educators and business leaders are banking on AI to shift the century-old factory model of training. In fact, 73% of businesses agree that AI will fundamentally change training approaches by personalizing them over the next five years. By putting AI into organizational workflows, L&D teams can also make on-the-job training relevant, tailored and focused. For instance, by processing in real-time the content of phone calls made to a call center, as well as the caller's underlying emotions, cognitive systems can guide agents to de-escalate tense situations, resulting in a better customer experience.¹⁶

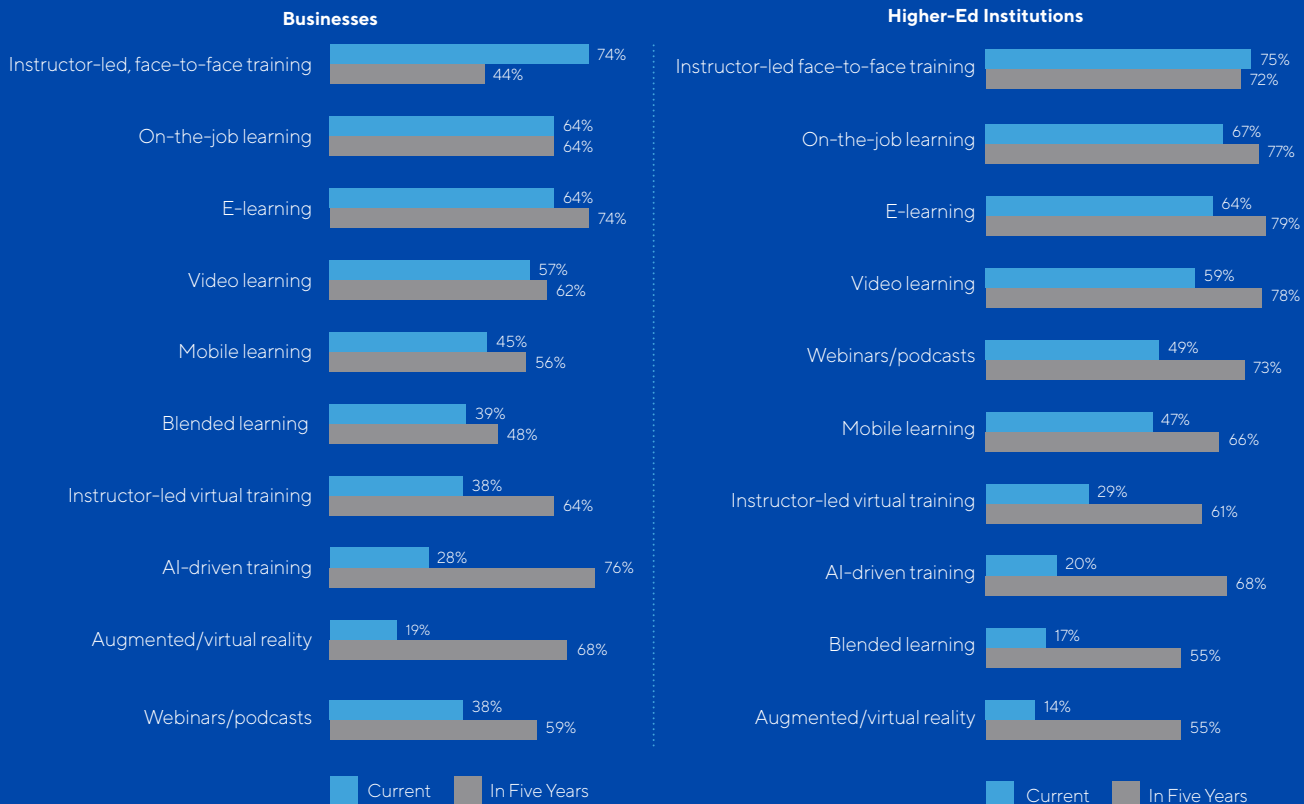
On the education front, AI will help teachers break free from the one-size-fits-all approach and focus on learning that matters. For example, Deakin University in Australia has created a platform that combines chatbots, AI, voice recognition and a predictive analytics engine to create an intelligent virtual assistant that provides students with advice.¹⁷ AI assistants can also help teachers provide real-time feedback on students' performance, strengths and weaknesses so that teachers can determine the exact skills gaps and learning needs of each student and provide supplemental guidance accordingly. While AI will not replace teachers, it will guide them to be better educators.¹⁸

The need for speed to accelerate the future of learning

Skills have become like mobile apps that need frequent upgrades. In fact, 80% of businesses believe that employable skills will evolve more rapidly in the future than they do now, creating a sense of urgency to learn faster or be left behind. Business respondents felt their learning methods and approaches will change more in the next five years than they did in the previous 20 (see Figure 8, page 21). But traditional educational and career pathways aren't designed to develop skills for a fast-changing market or to match the speed of changing industry requirements. As a result, a large majority of HEIs (84%) expressed concern about their ability to deliver learning with greater speed, agility and flexibility, compared with 58% of businesses.

Top 10 training and teaching approaches of the future

Respondents were asked which training approaches they use, now and in five years.



Source: Cognizant Center for the Future of Work
Figure 7

Tomorrow's learning experience will be more active, interactive and frictionless, and take place in an environment that blurs the boundaries between the traditional classroom and the world outside of it.

Quick Take

Self-learning: empowering people to take control of their learning

With the need for skill development more urgent than ever, businesses and HEIs are beginning to realize the importance of holding individuals responsible for staying relevant with changing skills demands. On average, 61% of all respondents said they plan to prioritize self-learning as a key training/teaching approach in the next five years.

To get there, companies and HEIs need to create a culture of learning in which individuals are self-motivated and curious. Business leaders must encourage people to experiment, take risks and learn from new ideas and technologies, a concept that is still not strong in many businesses. Only 28% of businesses in our study said they foster a culture of risk-taking and tolerate failure when experimenting with new technologies. One way to address this issue is by establishing a new role to manage and promote learning across the organization, according to 63% of business respondents. In our recent report ["21 More Jobs of the Future,"](#) we've identified the likely need for "Uni4Life Coordinators" in the future who will assist in facilitating lifelong learning for workers.¹⁹

Governments are also adopting innovative ways to encourage individuals to take ownership of their skills development and lifelong learning. Singapore's SkillsFuture initiative is aimed at helping people develop new skills in addition to their existing skillset for career resilience or a new career path. Adults over the age of 25 are given a US\$350 credit to pay for any training courses provided by 500 approved providers, including universities and MOOCs. The credit will not expire, and the government will provide periodic supplements, so individuals may accumulate credit over time.²⁰

We advise businesses and HEIs to address the following three elements in order to set the speed context for future learning:

- I Speed to monetize data.** Data will serve as a foundation to accelerate the speed of learning. How quickly you collect skill identification data (labor market data, employee and student data, etc.), analyze and apply it for content creation and curation (based on data intelligence and not gut feel), and feed it into the AI-driven training/teaching systems to deliver personalized learning, will determine the speed at which you prepare the current and future workforce. For example, at Udemy, L&D organizations can spot trending skills that 20-plus million people are learning worldwide on the company's platform, which can help them assess skills gaps within their workforce and act accordingly.²¹
- I Speed to simplify the technology infrastructure.** Nearly 66% of both businesses and HEIs face the challenge of integrating technology with existing systems. Bringing new learning delivery approaches driven by AI, AR/VR and other digital technologies to scale will require seamless integration with legacy systems. If ancient IT systems are holding back entities from creating a better learning environment, it's time to reboot their core IT, which could mean dropping the buy-and-hold mentality and replacing it with a pay-as-you-go model via cloud or a mobile and as-a-service offering, or leveraging partners to offload the legacy systems. (For more on building an IT foundation for the future of work, see our recent report ["The Future of IT Infrastructure"](#).²²)
- I Speed to innovate.** For many businesses and HE institutions, innovation equates to "it takes time." With a massive skill shift underway, however, the traditional six-month course creation cycle is no longer acceptable. Our data shows that 66% of businesses will manage innovation as a key marker to measure the effectiveness of their learning programs. This will only happen if business leaders and educators look outside their own four walls and join external ecosystems via platforms and partnerships.

Accelerating the speed of learning



Source: Cognizant Center for the Future of Work
Figure 8

WHAT COULD POSSIBLY GO WRONG?

**A TUG-OF-WAR BETWEEN
BUSINESS LEADERS
AND EDUCATORS**

Who is really responsible for the future of learning?

77%

of HEIs are concerned about businesses' abilities to train graduates for the new types of work driven by emerging digital technologies.

67%

of businesses are concerned about HEIs' effectiveness in preparing the workforce for future jobs.

69%

of HEIs believe it is the responsibility of businesses to provide graduates with a diverse range of human-centric skills.

70%

of businesses believe it is the responsibility of HEIs to provide graduates with a diverse range of human-centric skills.

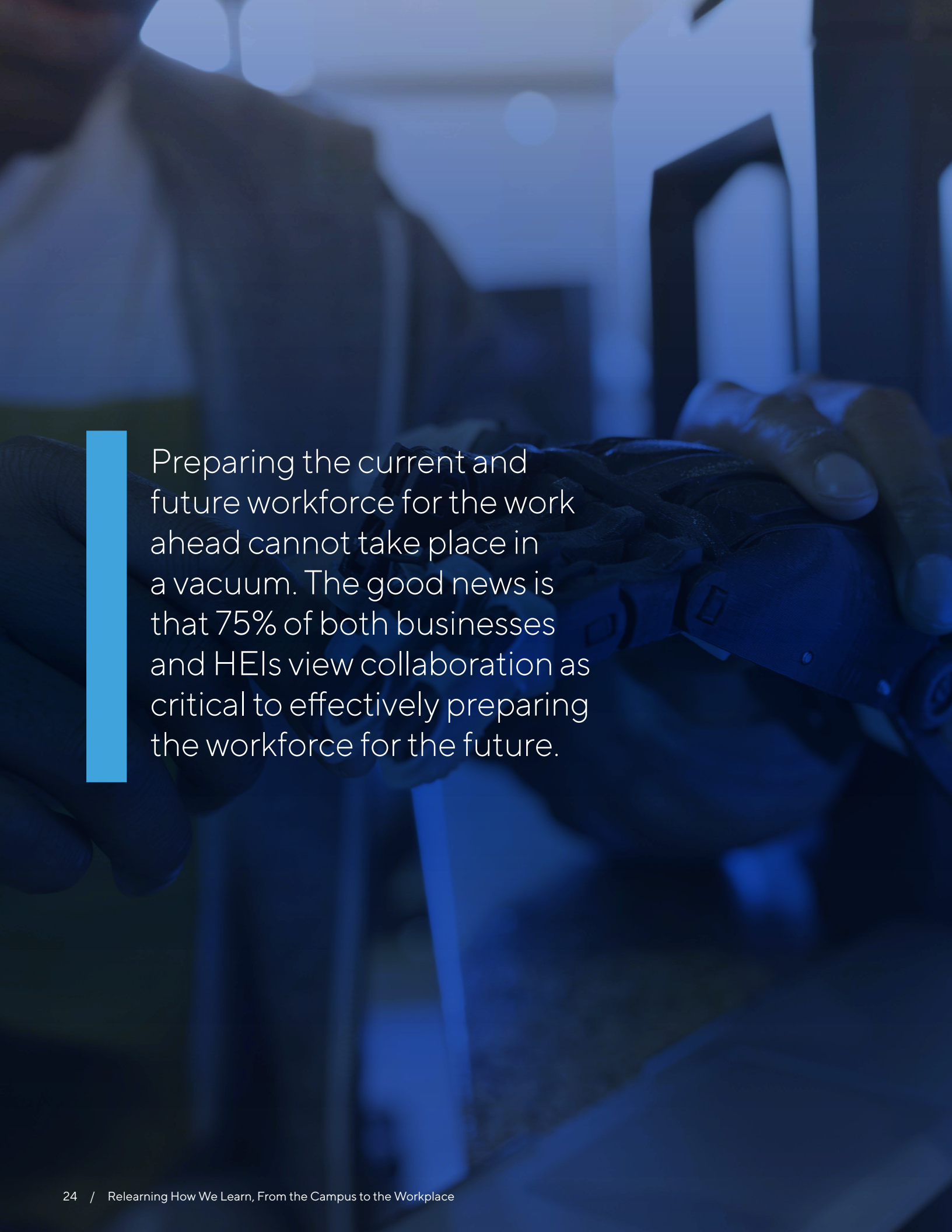
Source: Cognizant Center for the Future of Work
Figure 9

Who is responsible for preparing the current and future workforce? While it might seem obvious that both businesses and HEIs need to play a role, respondents tended to disagree. In our study, each seems to feel it's the responsibility of the other entity to prepare graduates with a diverse range of human skills (see Figure 9). At the same time, both are also highly concerned about each other's ability to prepare the workforce for future jobs. In fact, 74% of businesses reported that graduates do not have the necessary skills to add value to business upon leaving university/college. It is alarming (and disappointing) to see that just when both entities need each other's support the most, they are at odds with each other.

Preparing the current and future workforce for the work ahead cannot take place in a vacuum. The good news is that 75% of both businesses and HEIs view collaboration as critical to effectively preparing the workforce for the future. In order for collaboration to be successful, businesses can't serve merely as advisors but must also play a more significant role as partners with HEIs. The top four priorities that businesses have set for themselves to effectively collaborate with HEIs are increased engagement with students and educators to boost awareness about the future of work (65%), collaboration on research and innovation (62%), provision of career advice/talks (60%) and cooperation on curriculum design and study programs (55%).

HEIs are extremely well positioned to help businesses access and develop new talent, new ways of working, and research and product development. Some HEIs, like the University of Southern Denmark, offer consulting services to businesses on hiring and retaining satisfied new employees.²³ HEIs must also explore innovative ways to partner with various stakeholders (governments, tech companies, training providers, consultants, co-working companies, start-ups and industry associations) to build new learning approaches.

In one such partnership, co-working space provider WeWork and higher education digital platform provider 2U will expand access to learning opportunities for WeWork's 175,000 members and 4,000 employees worldwide, and enhance the educational experience of more than 13,000 students in 2U-powered graduate programs by creating additional opportunities to learn, connect and collaborate in-person. Both companies plan to jointly develop a future of learning and work center in a WeWork location in 2019, providing space for students, faculty and staff in 2U-powered programs to host master classes, lecture series and other events designed to showcase the future of work and learning.²⁴



Preparing the current and future workforce for the work ahead cannot take place in a vacuum. The good news is that 75% of both businesses and HEIs view collaboration as critical to effectively preparing the workforce for the future.

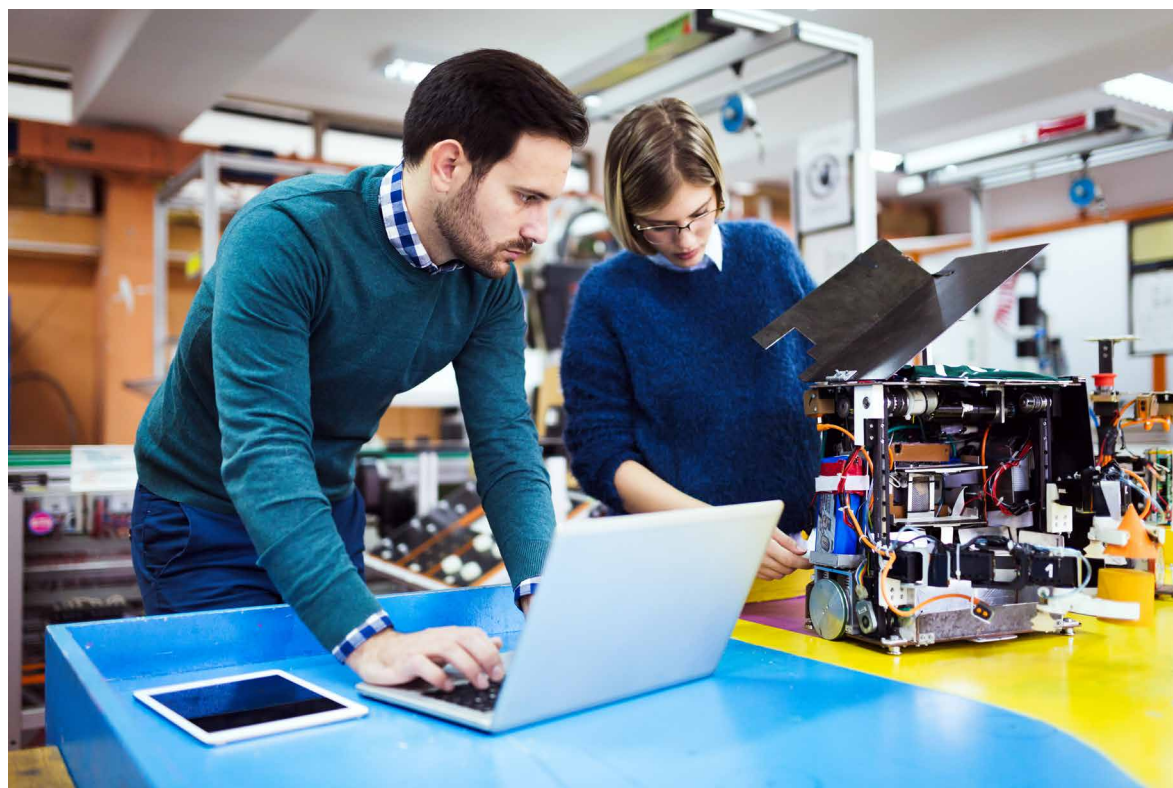
The future of work is the mirror image of the future of learning

“One day everything will be well, that is our hope. Everything’s fine today, that is our illusion.”

—Voltaire

You’ve seen the warning on your rear-view mirror, “Objects in the mirror are closer than they appear.” The future is approaching more rapidly than before. Skill and reskilling the workforce for jobs that are just emerging and don’t even exist yet is rocking our entire education system, business landscape and society. To reprise a classic cliché, this truly is a moment of great opportunity and great risk. How we respond to this moment – that is, the choices and decisions we make in the next few years – will shape the fate of many individuals, educators, businesses and economies. Now is the time for educators and business leaders to rethink their workforce learning models and their relationship with the future of work.

Our future of learning framework serves as a starting point for understanding what every individual needs to succeed in the work ahead. And as more companies and HEIs embrace the future of learning, they seek collaborative partnerships to successfully manage the transformative and disruptive impact of the new machine age.

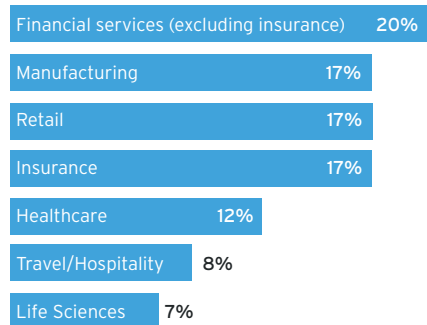


Methodology and demographics

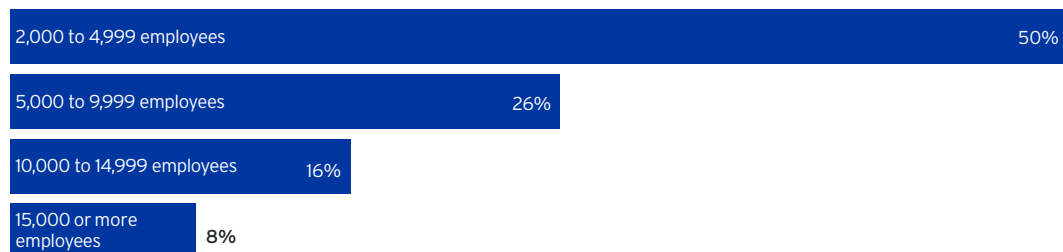
We conducted a telephone survey between July 2018 and August 2018, with 601 senior business executives across industries and 262 higher education institutions globally. Business survey respondents were distributed across the banking and financial services, healthcare, insurance, life sciences, travel/hospitality, manufacturing and retail industries.

Demographics – Business

By Industry



By Employee Size



Demographics – Region, including businesses and higher education institutions

By Region



Endnotes

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