CompTIA.

Workforce and Learning Trends
2021

Accelerating Through the Curve

April 2021
#FutureofWork

dentifying emerging trends is especially challenging in an economy still steering through a global pandemic that has upended the way we work and learn. But we take heart from the fact that our *Workforce and Learning Trends 2020: Meet the "New Traditional" Models,* published the month before lockdown last year, has held up well.

In that report, we found that the training industry is blending familiar learning methods with technological twists. Learning and Development (L&D) professionals in IT are enthusiastic about education technology, but not uncritical. They look for tech that allows them to do more of the personal, high-impact instruction that effectively builds and sustains the careers of their students.

This year, in *Workforce and Learning Trends 2021: Accelerating Through the Curve,* CompTIA finds that a vastly accelerated pace of change is forcing companies to make a choice. How quickly can they transition from business and workforce continuity to business and workforce innovation — from survival to building and creating? The COVID-19 pandemic put a twist in the path, but companies that accelerate through the curve will build momentum and lean into the future of work and learning.

To do that, companies are renewing their focus on innovative approaches to:

- worker resilience;
- diversity, equity and inclusion;
- operationalizing a learning culture;
- access to alternative learning and career pathways; and
- team-based deployments of artificial intelligence (AI) and automation.

To develop *Workforce and Learning Trends 2021*, CompTIA surveyed 400 U.S. human resources and workforce learning professionals about their organizations' response to the pandemic and their future plans for L&D and other activities. We also conducted qualitative interviews with L&D experts and a comprehensive literature review of trend reports and surveys from other authoritative organizations.

Below are five key trends we believe will characterize workforce development and training in the near future. As we noted last year, a topic as expansive as this must include many caveats, and the biggest caveat here is that our hopeful expectation of a post-pandemic era isn't a given. As we finalize this report in March 2021, it appears that a return to normal is within sight, particularly as effective vaccines become widely available. However, we also are mindful that March 2020 was a lesson in not taking anything for granted.

Still, the quantitative and qualitative signals that inform this report strongly suggest that workforce learning and development professionals are preparing for business environments that will change ever more rapidly.

Trends to Watch
2021
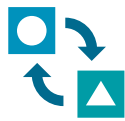
1 Companies renew focus on worker resilience

2 Business gets more proactive about DEI

3 Continuous learning is the new personalized learning

4 Alternative learning and career pathways are extending and branching

5 AI becomes a strategic partner of human-digital teams

2.4%

Unemployment rate for U.S. information technology professions as of February 2021 vs. 6.6% nationally.[1]

12.4 million

Projected growth of net tech employment in the U.S in 2021.[2]

850K

Average number of quarterly job postings during 2020 by U.S. employers seeking to hire information technology professionals.[3]

2X

Rate by which technology occupations are projected to grow vs. overall employment in the U.S. economy during the 2020-2030 period.[4]

$11.5 trillion

Estimated GDP growth G20 countries will miss out on by 2028 if skills don't keep pace with new technologies.[5]

80%

Global employers that are accelerating the automation of work processes in response to the pandemic.[6]

4X

Increase in the numbers of people seeking online learning on their own initiative.[7]

2025

Projected year in which the average time spent by humans and AI-enabled machines at work will be at parity.[8]

7 in 10

Number of HR professionals placing more emphasis on reskilling and upskilling efforts in the year ahead.[9]

3 in 4

Number of HR professionals who expect and support further eliminating the 4-year degree barrier for job candidates.[10]

$2.3 trillion

Estimated annual boost to the U.S. economy if racial inequities in income were eliminated.[11]

72%

Employees who think increased technology will "break down hierarchies and lead to more open communication that may advance their careers."[12]

1 | Companies Renew Focus On Worker Resilience

The pandemic tested the resilience of every organization. How employers work with their employees going forward will determine if innovation takes hold.

The 2021 CompTIA survey of HR leaders confirms what many other surveys have shown — that the pandemic created broad concern about employee work-life balance, workflows and morale. Looking ahead, 41% say their companies will have a new emphasis on communication and on emerging tech skills for remote work, and 42% expect new efforts on upskilling and reskilling for incumbent employees.

For all the anxiety about needing resilient and agile organizations in recent years, the pandemic response demonstrated that those qualities may have been available all along. Under very difficult circumstances, and in a matter of weeks, workers at many companies stood up entirely new operating models. They built safer socially distanced workspaces, established new workflows for hybrid teams, shifted learning curricula online and, of course, shifted to working from home.

This came at enormous cost for many subsegments of workers. But having survived that difficult period together could be the basis of a relationship reset between employer and employee. For example, one survey of chief human resource officers found that many feel "the level of engagement both between colleagues and between leaders and employees has become much deeper during the crisis."[13]

Some companies, such as Google, have established "resilience teams" that use tech tools to check on employee wellness and deliver training in mindfulness and communication.[14] And Udemy's annual workplace training trends report shows huge jumps in demand for courses in anxiety management and stress management.[15]

One point that comes up frequently in discussions about building a resilient workforce is the need for specificity. As we noted last year, the discussion of soft skills is often too subjective, and the same is true of agility and resilience. Trainers and hiring managers need to take care to identify well-defined competencies that lead to resilience.

How the pandemic affects vulnerable workers

Low-wage roles
Brookings Institution research shows that low wages correlate to less access to career mobility resources, including employer upskilling.[16] African-American and Latinx workers are overrepresented in low-wage jobs that are most vulnerable to pandemic-related layoffs, such as food service, clothing retail, travel accommodations and personal services.[17] As of June, 2020, the unemployment rate for these groups was 15%, compared to 9% for white workers.[18]

Older workers
A New School study finds that for the first time since 1970, older workers have higher unemployment rates than their mid-career colleagues. Unlike in previous recessions, they are being laid off more quickly and hired back more slowly.[19]

Working parents
The share of mothers and fathers at work is down and recovering slowly, as is the number of hours working for those who are employed. About 5.5% fewer mothers and 5% fewer fathers were employed in October 2020 compared to October 2019.[20]

Working mothers
Moms working from home are twice as likely as dads to say they have a lot of childcare responsibilities while working.[21] The Center for American Progress finds that the age of the youngest child is the most predictive signal of a woman's labor force participation.[22]

Tech-forward responses to the pandemic

In our survey of HR leaders:

- 38% say they offered new or expanding technology stipends for work-from-home employees.
- 41% hired new staff in IT support, network engineering, software development, data analytics or cybersecurity.
- 41% have a new emphasis on soft skills for virtual work when hiring tech staff.
- 55% have new processes for virtual recruiting and interviewing.
- 62% are likely to hire for new lines or to backfill in IT or technology roles.

Stephanie Morgan, director of education and edtech at CompTIA, believes resilience may be a happy byproduct of more attention to employee well-being. "Businesses have realized they have to talk about people like they're people, not like they're assets," she says. "They're acknowledging that people are messy and have emotions and have families. This past year, corporate culture has become humanized."

Amy Kardel, vice president of strategic workforce relationships at CompTIA, says the last year has created an environment of forced necessity: "When you don't have any baking powder, you try baking soda and see what happens. The pandemic created a lot of that forced necessity and now the question is if it will lead to sustained innovation."

"Issues of women and members of underrepresented groups struggling with work-life balance, especially when they're primary caregivers, have always existed. COVID just brought them to the forefront. Now that we're having to pay more attention to it, I don't see us giving it up."

— *Yvette Steele, director of member communities at CompTIA*

What's new with soft skills?

In our survey, 41% of HR leaders say their organizations will have a new emphasis on soft skills for IT workers.
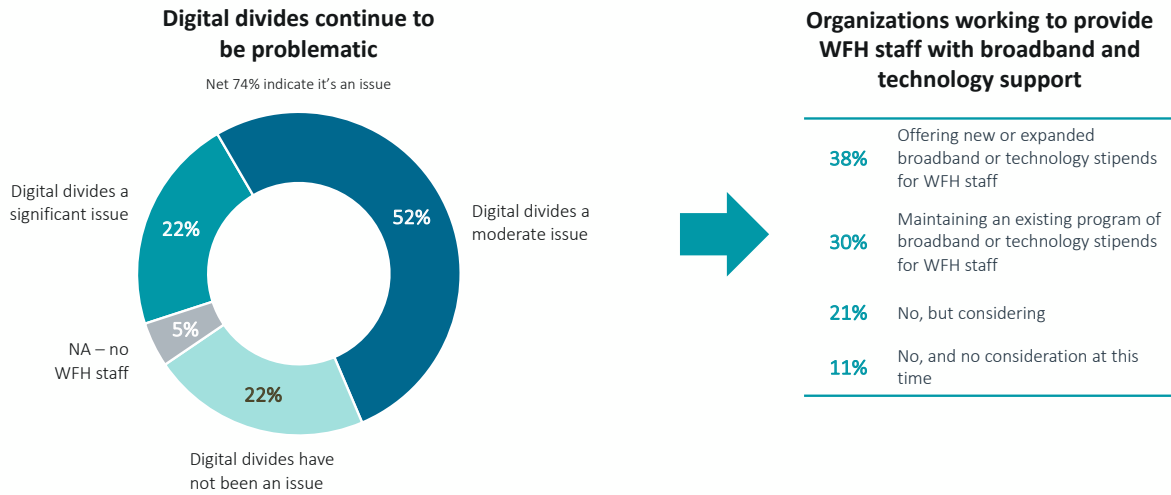
Last year we made the point that "soft skills" were in high demand but challenging to define and strategically prioritize. Employers are often asking for a range of higher-order cognitive skills alongside dispositional traits like integrity and work ethic. If anything, the list of desired soft skills has gotten longer during the pandemic, as discussions now also often reference self-management and stress tolerance.

The pandemic probably made the need for soft skills more acute, particularly people skills that are based in empathy. As Teresa Sears, senior director of certification product management at CompTIA, says, employers have always wanted multi-dimensional employees who can operate across different domains, but now there's a new domain.

"You're seeing people's homes," she says. "You're seeing their kids and pets, and you can't help but recognize that person isn't just someone who sits in the cube by the cafeteria. There's an admission that this is hard. I do think there is an increase in people more attuned to how people are doing."
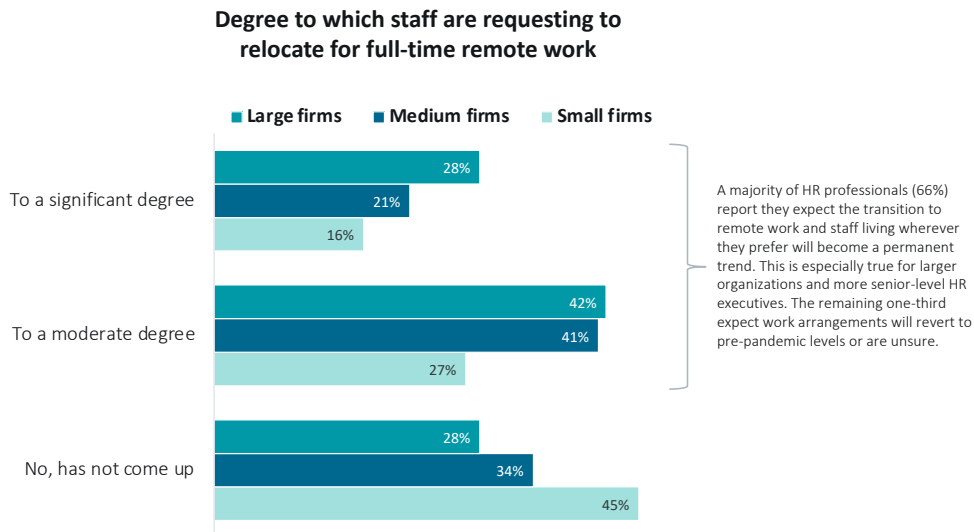
Digital divides compound an already difficult situation

Digital divides continue to be problematic

Net 74% indicate it's an issue

Digital divides a significant issue **22%**

52% Digital divides a moderate issue

NA – no WFH staff **5%**

22% Digital divides have not been an issue

Organizations working to provide WFH staff with broadband and technology support

38%	Offering new or expanded broadband or technology stipends for WFH staff
30%	Maintaining an existing program of broadband or technology stipends for WFH staff
21%	No, but considering
11%	No, and no consideration at this time

Source: CompTIA | survey of 400 HR professionals

The transition from periodic telecommuting to permanent remote work

Degree to which staff are requesting to relocate for full-time remote work

■ **Large firms** ■ **Medium firms** ■ **Small firms**

To a significant degree
- Large firms: 28%
- Medium firms: 21%
- Small firms: 16%

To a moderate degree
- Large firms: 42%
- Medium firms: 41%
- Small firms: 27%

No, has not come up
- Large firms: 28%
- Medium firms: 34%
- Small firms: 45%

A majority of HR professionals (66%) report they expect the transition to remote work and staff living wherever they prefer will become a permanent trend. This is especially true for larger organizations and more senior-level HR executives. The remaining one-third expect work arrangements will revert to pre-pandemic levels or are unsure.

Source: CompTIA | survey of 400 HR professionals

2 | Business Gets More Proactive About DEI

The disruptions caused by the pandemic made inequalities more visible. That, and the long-overdue awakening to systemic racism sparked by countless injustices, are accelerating the movement toward diversity, equity and inclusion in the workplace.

Over half of HR professionals in our survey expect their organizations will pursue new initiatives related to diversity, equity and inclusion in the year ahead, and those initiatives are more likely to be intentional and accountable.

Take for example a project announced by the World Economic Forum in January 2021. Partnering for Racial Justice in Business, which has commitments from 48 global companies, is "designed to operationalize and coordinate commitments to eradicate racism in the workplace and set new global standards for racial equity in business."[23]

Meanwhile, the Nasdaq plans to require listed companies to disclose their diversity efforts,[24] and 80% of corporate boards are planning to tie executive pay to environmental, social and governance metrics including DEI.[25]
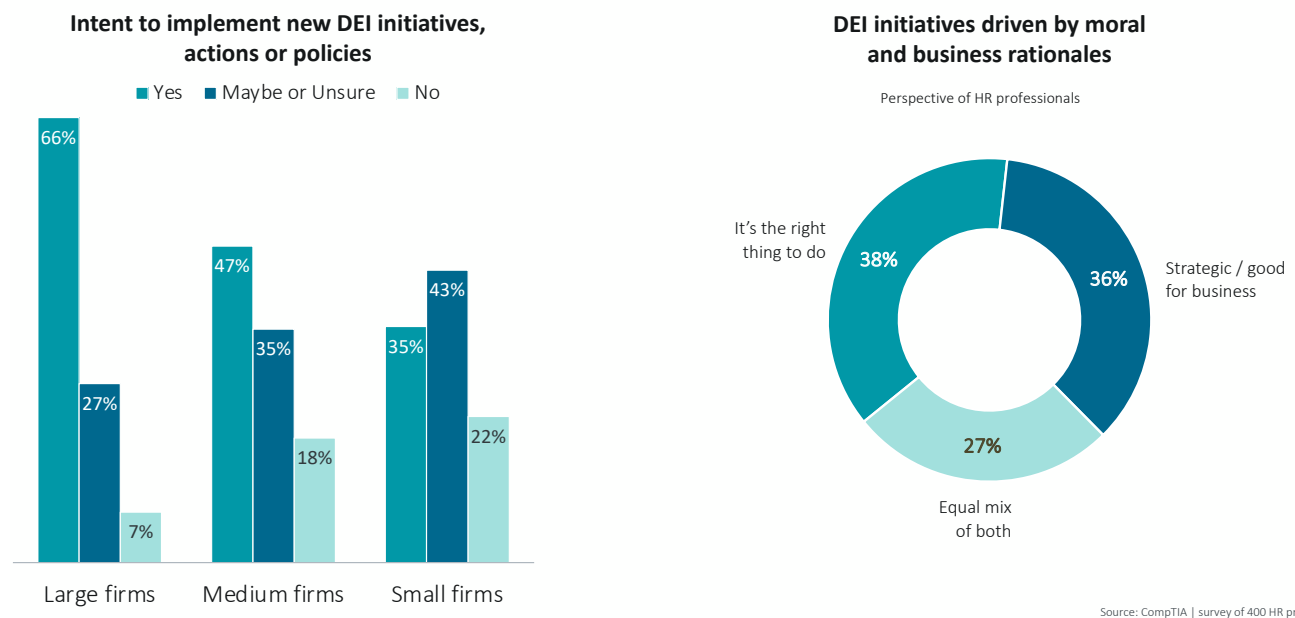
Yvette Steele, director of member communities at CompTIA, says concrete steps like these are a change from the past. She worried that the supportive statements put out by many companies after the George Floyd killing in June 2020 would be "one and done" with no follow through.

However, she says, "it's refreshing how organizations are demonstrating that those commitments were real. They're holding themselves accountable and publicizing the actions they've taken. Companies are being proactive about their diversity commitment. More importantly, they're tying that into how belonging plays a big part, because diversity won't work without inclusion."

And while there is more momentum for DEI efforts in larger employers, the discussion is also increasing in smaller companies. Charles Eaton, executive vice president of social innovation at CompTIA, says he has been noticing more attention to DEI at companies that are "out of the limelight" and don't have the same public pressure to improve.
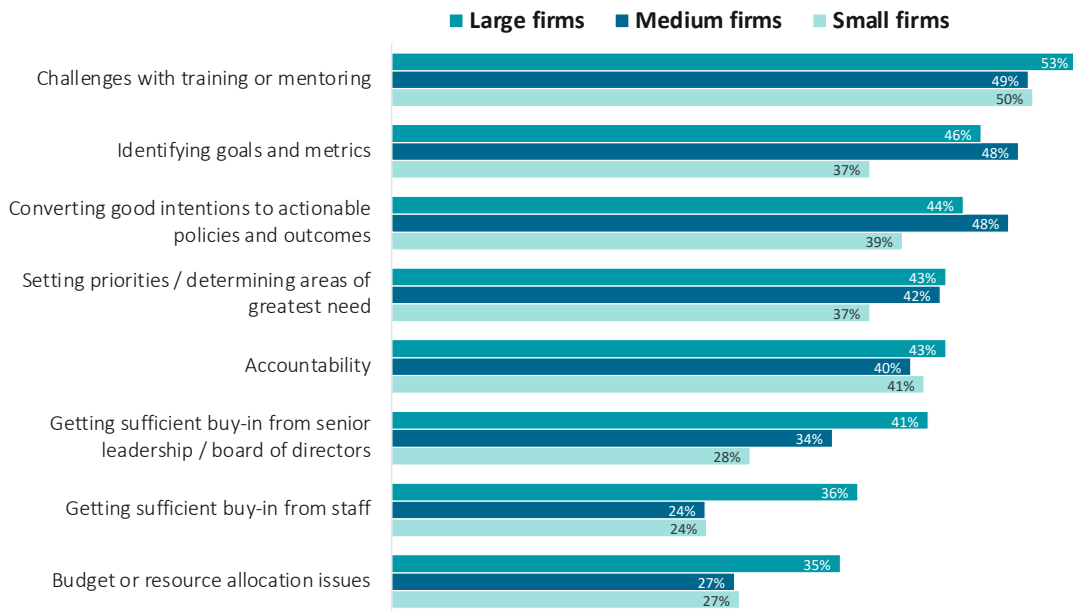
Still, businesses are still struggling to operationalize DEI activity. As HR industry analyst Josh Bersin notes in his 2021 predictions, skills in this domain are not widely distributed, and many organizations haven't figured out what metrics to use.[26] Our survey of HR leaders reinforces that.

Organizations expect to implement a range of new DEI initiatives in year ahead

Intent to implement new DEI initiatives, actions or policies

■ Yes ■ Maybe or Unsure ■ No

	Large firms	Medium firms	Small firms
Yes	66%	47%	35%
Maybe or Unsure	27%	35%	43%
No	7%	18%	22%

DEI initiatives driven by moral and business rationales

Perspective of HR professionals

It's the right thing to do 38%
Strategic / good for business 36%
Equal mix of both 27%

Source: CompTIA | survey of 400 HR professionals

Some technology is emerging that supports DEI initiatives. Blendoor, for example, creates Glassdoor-like scores of a company's DEI performance, and Textio scans the text of job ads for bias before you publish. But no AI-powered bot yet exists that will flag and smooth over interpersonal tensions in the workplace. DEI is a hand-built effort that takes consistent attention.

HR perceptions of challenges that may inhibit DEI efforts

■ Large firms ■ Medium firms ■ Small firms

Challenges with training or mentoring
- Large firms: 53%
- Medium firms: 49%
- Small firms: 50%

Identifying goals and metrics
- Large firms: 46%
- Medium firms: 48%
- Small firms: 37%

Converting good intentions to actionable policies and outcomes
- Large firms: 44%
- Medium firms: 48%
- Small firms: 39%

Setting priorities / determining areas of greatest need
- Large firms: 43%
- Medium firms: 42%
- Small firms: 37%

Accountability
- Large firms: 43%
- Medium firms: 40%
- Small firms: 41%

Getting sufficient buy-in from senior leadership / board of directors
- Large firms: 41%
- Medium firms: 34%
- Small firms: 28%

Getting sufficient buy-in from staff
- Large firms: 36%
- Medium firms: 24%
- Small firms: 24%

Budget or resource allocation issues
- Large firms: 35%
- Medium firms: 27%
- Small firms: 27%

Source: CompTIA | survey of 400 HR professionals

Fully integrating DEI efforts into the organization still a work in progress

44% HR professionals that believe their organization has fully integrated DEI thinking and practices into recruitment, performance management, leadership, business operations, and related facets of the organization

48% HR professionals that believe their organization has partially integrated DEI thinking and practices.

9% HR professionals that believe their organization has minimally integrated DEI thinking and practices.

Source: CompTIA | survey of 400 HR professionals

76% of Americans believe racial discrimination is a serious problem.[27]

Amy Kardel says, "I hear a lot of listening for, 'How do we do it?' There's that index between what I say and what I do. There's real momentum toward actually doing something. The problem is, if it was not easy in good times, it's not easy in a pandemic either."

Another challenge is that while the sudden acceleration of remote work has illuminated many inequalities, it has also exacerbated them. A new report from the National Fund for Workforce Solutions documents how variations in the "social determinants of work" — including family responsibilities and access to technology, learning and transportation — create occupational segregation that costs the U.S. economy $2.3 trillion per year.[28]

L&D that doesn't account for the complexities of how people access it will leave less advantaged workers behind. As we say in section three below, learning opportunities need to be continuous and distributed — anytime, anywhere — to be effective for all employees.

"You're not going to change people's biases and behaviors in a one-hour training or a half-day workshop," Steele says. "In a learning culture, everyone in the organization is educated, empowered and equipped to have those teaching moments as they arise."

DEI resources from CompTIA

- Diversity and Inclusion Commitment
- Diversity and Inclusion Plan for Technology SMBs
- A Guide to Hiring Without Unconscious Bias
- Diversity Action Plan Workbook
- Diversity Index

3 | Continuous Learning Is the New Personalized Learning

The goal of a learning culture is achieved with high-quality continuous learning that is available anytime, anywhere, for any learning modality.

n our survey, over 75% of HR leaders expect to increase the tools they use to personalize talent development activities, with people from large employers much more likely to say it will increase significantly. Overall, this supports a trend toward delivering personalized experiences to employees.

However, our qualitative interviews and research suggest that a lot of what has passed for personalized learning has been just a form of segmentation. It didn't necessarily allow individual learners to choose what content or paths worked for them personally.

Nor did it allow them to choose when and where they learn, since most training is still delivered as a point-in-time event. A truly personalized experience probably isn't achievable until employees are in an environment of continuous learning, where they can turn it on like a tap when they need it most.

Continuous doesn't necessarily mean voluminous. As Josh Bersin says, "People need more contact, not more content. Therefore, it's important to complement online learning with some kind of interaction and collaboration."[29] Interaction ideally comes in the form of hands-on and experiential learning, which is especially important in technology training or in any workplace shifting to performance-based hiring.

Katie Hoenicke, senior director of learning product management at CompTIA, says, "In good learning design, you have the right mix of learning modalities with feedback. You don't want learners just floating through modules for several hours with an assessment at the end."

A continuous learning approach aligns with making learning a strategic initiative instead of a check-the-box operation. It turns learning into a business advantage by operationalizing a learning culture in concrete ways. It can enable learning at a greater scale and, not incidentally, it can support DEI initiatives by accommodating the diverse ways individuals access career development opportunities.

Continuous learning includes training that is optimized for mobile devices and is provided in a variety of formats. It is frequently updated and often includes a social element that encourages employees to source and share new examples and developments. It provides information at the moment it is most needed instead of out of context in a "one-and-done" training.

Most importantly, continuous learning is embedded in a culture that allows a worker to make time for learning when they are ready — when, for example, they clearly see the lights flashing green on a new career path.

40% of workers globally say they are struggling to learn new skills for the digital era.[30]
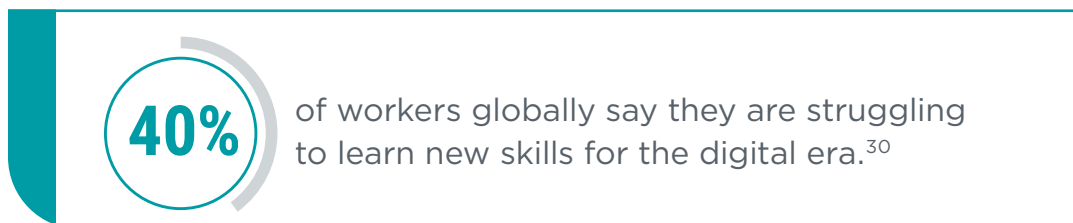
Stephanie Morgan, director of education and edtech at CompTIA, says continuous learning is part of a larger trend to understand employees holistically. "The pandemic shattered the idea of event-based training," she says. "Education is an ongoing thing, and it's a relationship between the employee and the organization. It's related to their job function, but it's also related to their professional career."

Part of the challenge of continuous learning is that "it is really messy," Morgan says. "The idea of a career path may be 'You take these steps and you will move up with our organization.' But many organizations are hesitant to do that because their futures are uncertain. An employer is not a college where if you earn these credits you will graduate."

One lasting impact of the pandemic will be remote and hybrid work models that will make event-based learning even more difficult to access. Another may be a permanently altered "consumer behavior" where employees expect to work independently and to direct their own time more.

Technology that can support continuous learning includes:

- adaptive learning technology that lets people work at their own pace by skipping ahead, pausing, repeating or stopping out where they need;

- learning record software that can track and credit a variety of learning experiences;

- learning experience platforms that provide an anytime, anywhere "streaming channel"-style access to content;

- social learning platforms that allow employees to connect and collaborate in personal ways; and

- employee experience platforms that allow self-service for individual employees accessing all HR functions.

New responsibilities for L&D

If the pace of change is accelerating, that means workers throughout an organization have more to keep up with. These are some of the new skills L&D may have to help their workforce with:

- Pairing scalable learning tech with effective experiential learning
- Change management in fast-evolving environments
- Customer education skills as new products are introduced into the marketplace
- Remote customer service
- Asynchronous collaboration and communication
- Data security from home offices
- Fine-tuning AI tools and interpreting their outputs
- The care and feeding of robotic process automation scripts
- Data literacy and digital fluency

Organizations to place more emphasis on reskilling/upskilling efforts in 2021

Organizations' ratings of reskilling/upskilling importance

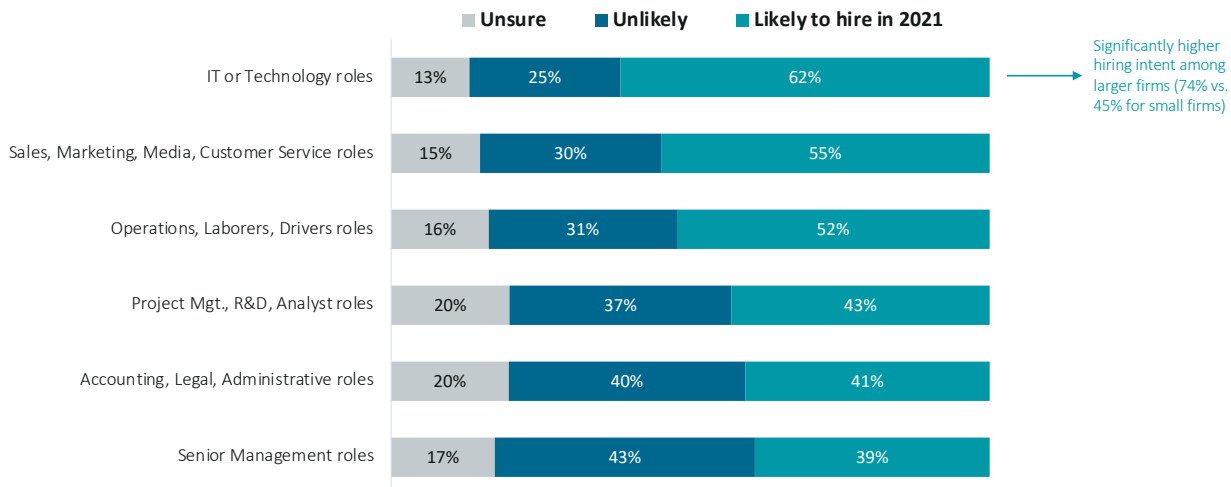■ More important [net] ■ About the same ■ Less important [net]

	Overall	Large firms	Medium firms	Small firms
More important [net]	67%	79%	68%	52%
About the same	26%	16%	26%	39%
Less important [net]	6%	5%	6%	8%
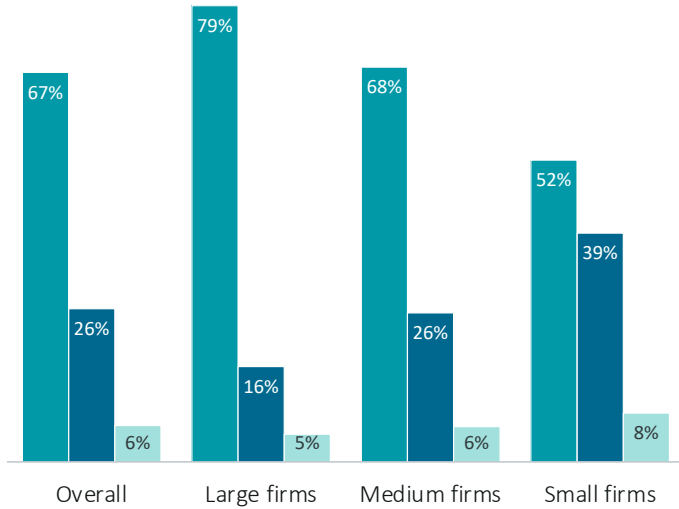
Strong positive correlation
between HR support for industry-recognized certifications and the importance they place upon reskilling/upskilling

Net importance of reskilling/upskilling

83%	Highly relevant
57%	Moderately relevant
31%	Not that relevant

Source: CompTIA | survey of 400 HR professionals

2021 hiring intent spans range of job roles

■ Unsure ■ Unlikely ■ Likely to hire in 2021

Role	Unsure	Unlikely	Likely to hire in 2021
IT or Technology roles	13%	25%	62%
Sales, Marketing, Media, Customer Service roles	15%	30%	55%
Operations, Laborers, Drivers roles	16%	31%	52%
Project Mgt., R&D, Analyst roles	20%	37%	43%
Accounting, Legal, Administrative roles	20%	40%	41%
Senior Management roles	17%	43%	39%

Significantly higher hiring intent among larger firms (74% vs. 45% for small firms)

Source: CompTIA | survey of 400 HR professionals

4 Alternative Learning and Career Pathways Are Extending and Branching

The debate over the future of work confirms the many challenges of navigating an increasingly complex digital world. These forces are driving employers and workers to seek new career on-ramps and models that enable internal mobility.

Employers in our survey continue to seek more on-ramps for new employees and for more effective ways to upskill and reskill current employees. Of these, 57% of senior leaders expect a continued trend toward de-prioritizing the four-year degree. However, another 24% support the trend but have questions given the challenges of countering inertia.

Asked what could influence this trend, culture change is one of the biggest factors: 44% say it will happen if organizations are more agile in general, and the same percentage say a significant obstacle is organizational resistance to change. The trend toward retaining and advancing incumbent employees to fill critical roles may be clearer, with 50% of people from large organizations saying they plan new efforts to reskill or upskill technology staff in response to the pandemic.

Burning Glass Technologies is one of many organizations pointing to the power of adjacencies to multiply the paths in a career map. With data about what skills exist in the workforce and what is needed, shortcuts to new roles start to reveal themselves. They found that "in all but two of [emerging disruptive skills], there are at least 200 occupations that represent strong candidates for upskilling."[31]

Employers do have some practical steps available to create more on-ramps and to retain employees for hard-to-fill roles. For example, employers can be less subjective and more specific about what they're looking for.

CompTIA's Executive Vice President of Social Innovation Charles Eaton says, "We don't see enough alternative credentials identified in the job listings. Getting rid of the degree requirement is a great first start. Now they have to say what lines up with the skills they need."

Similarly, Zeshan Sattar, CompTIA's director of learning and skills certification, UK, explains, "We've all seen business leaders on stage saying, 'Give me someone non-technical and I will get them into a cybersecurity role.' Then you send them people who are non-technical, and it's 'No, we don't want that.' The only way to alleviate that is to have a shared lexicon. Until we all come speaking the same language of knowledge, skills, attributes and behaviors, we're never going to get there."

Bringing apprenticeships into the information age

The apprenticeship, an old form of on-the-job-training, is a high-leverage way to deal with several of the challenges noted in this report:

- It creates access to opportunity for a more diverse population of workers.

- It de-emphasizes the four-year degree and shifts attention to potential and skills.

- It is more effective than event-based learning that is decoupled from real-world experiences.

- It puts a learning culture into practice and makes it visible.

- It improves retention and solves the problem of where to find people with emerging skills.

For example, one new role difficult to hire for is managing and optimizing robots. Amazon recently launched an apprenticeship for mechatronics and robotics technicians as part of their Upskilling 2025 initiative. Employees in the program get 12 weeks of training followed by a year working alongside a specialist.[32]

Employers don't need to be one of the largest companies in the world to implement their own apprenticeship programs. Collaborations like one launched by CompTIA and Maher & Maher last year build a network of employers and education providers to create pathways to employment in high-demand IT roles.[33]
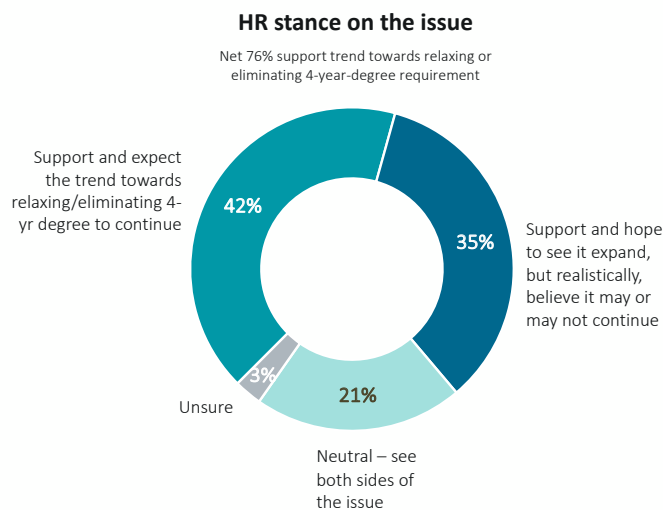
"There's a lot of legislation now building up apprenticeships," says Amy Kardel, vice president of strategic workforce relationships at CompTIA. "It's a third wave of apprenticeship in America, and it's going to stick this time, I think. There's enough momentum that the curricula are being defined and employers are seeing the advantage. I'm encouraged, because this creates more equity for people who can't off-ramp to add tech skills or to earn a four-year degree."

Second, training has to be connected to real roles. Senior Director of Certification Product Management Teresa Sears asks, "Are employers going to offer an opportunity for trained individuals to apply skills on the job? That's where the rubber meets the road in professional development. If it's just training, it won't work. There has to be some opportunity to apply skills."

Technology is emerging that helps extend and multiply career paths, including internal marketplaces and people analytics software. Building on previous generations of these approaches, firms such as EMSI with their Skillabi platform or FutureFit AI with their career transition platform use new data modeling techniques to fine-tune skills matching for alternative career pathways. Pairin's software compares specific roles to assessment results to generate learning paths. Similarly, CompTIA's career path planning tool uses data to guide aspiring IT professionals or career changers through the options for entering the field.

This is one trend that may still be waiting for significant culture change within organizations. On-ramps and internal mobility paths will be more visible when we are more likely to hire based on potential and less likely to default to layoffs instead of rapid bridging, cooperative redeployment and job sharing.

HR professionals support relaxing or eliminating 4-year degree requirement for job candidates, but questions remain
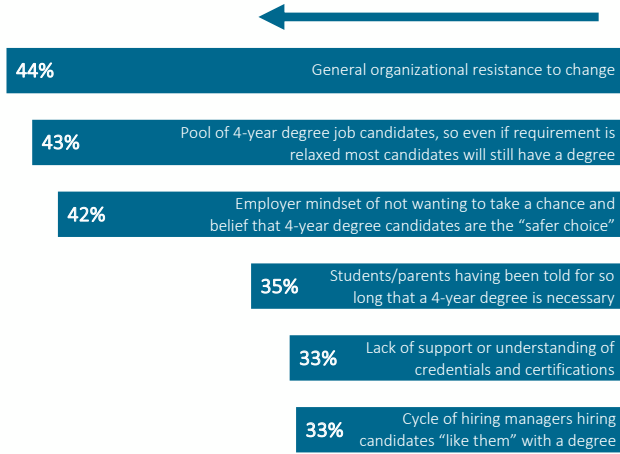
HR stance on the issue

Net 76% support trend towards relaxing or eliminating 4-year-degree requirement

Support and expect the trend towards relaxing/eliminating 4-yr degree to continue **42%**

35% Support and hope to see it expand, but realistically, believe it may or may not continue

3% Unsure

21% Neutral – see both sides of the issue

Support highest among HR professionals that value industry-recognized certifications

81% Certifications highly relevant

75% Certifications moderately relevant

54% Certifications not that relevant
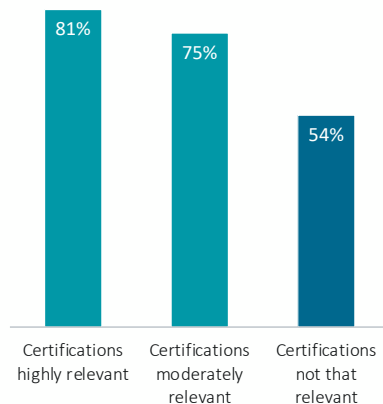
Factors **inhibiting** employers from further relaxing or eliminating 4-year degree requirement for candidates

←

44%	General organizational resistance to change
43%	Pool of 4-year degree job candidates, so even if requirement is relaxed most candidates will still have a degree
42%	Employer mindset of not wanting to take a chance and belief that 4-year degree candidates are the "safer choice"
35%	Students/parents having been told for so long that a 4-year degree is necessary
33%	Lack of support or understanding of credentials and certifications
33%	Cycle of hiring managers hiring candidates "like them" with a degree

Factors **driving** employers to further relax or eliminate 4-year degree requirement for candidates

→

General trend toward workplace agility and focus on skills/performance rather than degrees	43%
Sufficient evidence that candidates of all types can be successful	42%
Greater commitment internally to on-the-job training	40%
COVID forcing employers and workers to rethink all facets of employment	40%
High cost of 4-year college degrees and more students/parents seeking alternatives	40%
Employer desire to expand candidate pool (especially in hard-to-fill positions)	38%

Source: CompTIA | survey of 400 HR professionals

Tech hiring consideration for non-4-year-degree holders

	Unlikely or unsure	Possibly / depends	Likely to accept candidates w/o 4-yr degree	Net likely + possibly
IT support / help desk positions	17%	40%	43%	83%
Data analyst / database positions	21%	47%	33%	80%
Software developer / web developer positions	25%	42%	33%	75%
Cybersecurity positions	27%	40%	34%	73%
Network engineers	28%	41%	31%	73%
CIO / IT management	31%	37%	33%	69%

Source: CompTIA | survey of 400 HR professionals

5 AI Becomes a Strategic Partner of Human-Digital Teams
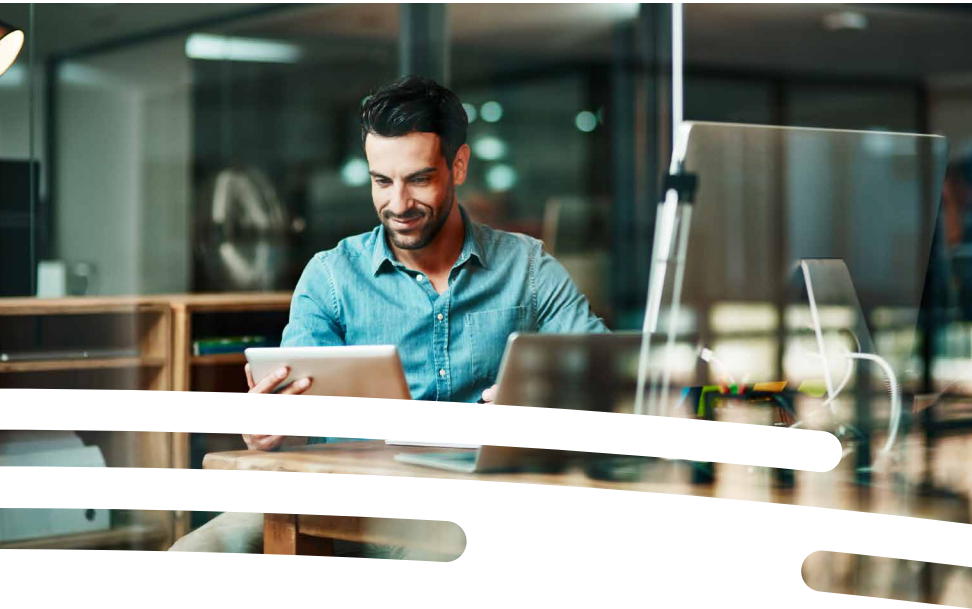
Automation is no longer just a tool. Human-AI hybrid team models are emerging, and workers will have to be both more creative about collaborating with AI and more analytical about what the AI is creating.

Over 80% of respondents in our survey expect AI to have either a moderate or significantly increased impact on HR in the year ahead, and people in senior roles were much more likely to say it will have a significant impact. A majority of companies are either piloting or actively using AI in candidate screening, onboarding, competency assessment and career planning,

Several other surveys confirm this trend. For example, a World Economic Forum survey found that more than 50% of global businesses have accelerated automation in response to the pandemic, and they estimate that by 2025, the time spent on current tasks at work by humans and machines will be equal.[34]

Meanwhile, the workers whom HR supports are increasingly part of a growing teamwork model variously characterized as intelligent automation or the augmented workforce. Deloitte anticipates the growth of "superteams" of humans and technology that use complementary skills to create new ways of working.[35] Similarly, Citrix envisions the rise of "powered productives" who are "fueled by a flourishing partnership between people and technology."[36]

Expectations for AI's impact in HR

Perspective of HR professionals in how AI and related smart data analytics and automating technologies will impact talent requirement, development and management in the year ahead
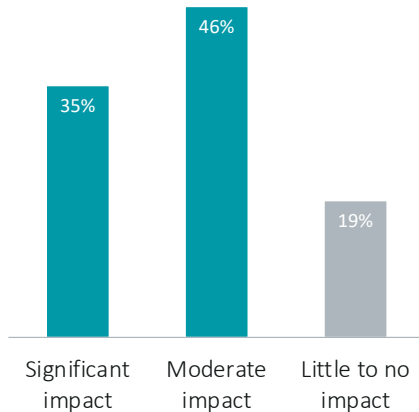
Example of AI-enabled technology or data use case	No action taken	Exploring or piloting	Actively in use	Net actively in use + exploring
Candidate competency assessments	29%	39%	32%	71%
Interview scheduling / candidate engagement	29%	39%	31%	71%
Employee self-service (ESS) tools, e.g. smart virtual assistant	29%	40%	31%	71%
Onboarding	36%	38%	26%	64%
Employee career planning, e.g. upskilling assessments, smart job role matching, career pathway planning	32%	43%	25%	68%
Candidate sourcing and initial screening	31%	45%	25%	69%

Source: CompTIA | survey of 400 HR professionals

Seth Robinson, senior director of technology analysis at CompTIA, says the growth in automation technologies should be understood across two axes — more and different.

First, while automation has always been with us, there has been a leap forward in the adoption of cloud-based architecture that will be the foundation of new operating models. The cloud also makes available more of the computing power needed for AI.

Meanwhile, the AI being deployed in the workplace has shifted in character from deterministic to probabilistic. It's more scalable but has an element of randomness that requires examination and interpretation.

"Maybe we're replicating and displacing yet another piece of human work, but there are complications in that," Robinson says. "The fact that we're asking computers to take a guess means we might need more human oversight to make sure that those guesses are accurate."

Accelerating automation, combined with the pandemic, could create a double whammy for the most vulnerable workers. How many new jobs emerge to replace the old — how much creativity there is in the creative destruction — is a debate as old as economics. The likelihood of workers in specific roles making the transition is even harder to estimate.

For example, a McKinsey survey of executives anticipates strong new hiring in AI and robotics, as well as in health and safety roles. But it also notes that "the mix of jobs that emerge from this crisis is likely different than those that were lost. People with the lowest incomes and educational attainment have been disproportionately affected, putting strains on achieving inclusive growth and potentially raising income inequality. Small and midsize businesses and communities of color, already more severely affected by COVID-19, are also more vulnerable to disruption from increased automation."[37]

Losses can be offset somewhat by some workers climbing the tech stack ahead of automation to respond to the demand for more innovation. For example, says Robinson, when companies shifted from local server rooms to the cloud, "they didn't replace their server admins. Instead, they said, 'We need that person to fine-tune the infrastructure so our software development effort can be accelerated.'"

In the same way, he continues, "With AI, people aren't going to say, 'This is doing the work of a business analyst or a data scientist.' They're going to say, 'These results are great, and now we can invest more in interpreting the results and giving us a plan for the future.'"

But workers can only prepare to collaborate with their teammates — both human and digital — with effective support from L&D. That means building not only emerging technology skills but also the ability to interpret, explain, adapt, consider other perspectives and align tasks with big-picture goals.

To begin with, Robinson says, business leaders need to center L&D in key decisions rather than just relying on it as a cost center that trains workers on the features of new technology. "L&D has to be plugged into the technology strategy and understand the human elements that need to be built up to use it effectively," he says. "Companies moving toward strategic L&D are not just throwing things over the wall anymore."

Meanwhile, he says, L&D needs to understand the two dimensions of more and different: "AI changes the questions being asked and the nature of the skills required. It's not just building new skills into a curriculum. It's teaching that we need to think more critically. We need to consider the data that's coming in and ask ourselves important questions before we start using these results.
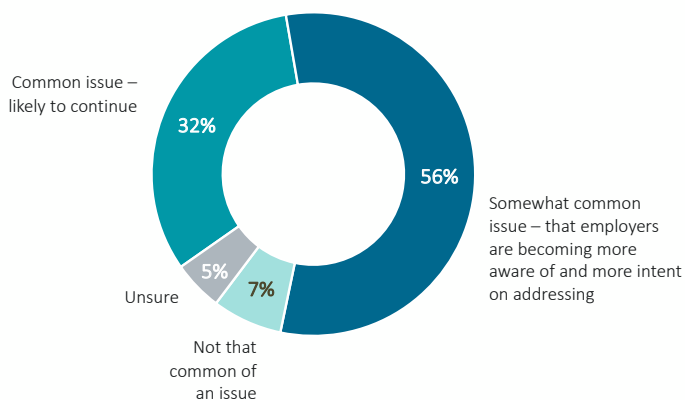
Where are the next skills gaps coming from?

In our survey, 74% of large firms are likely to hire for IT or technology roles in 2021. Looking further on the horizon, new high-demand skills could emerge, driven by these forces:

- Advanced infrastructure and hardware create new roles and specializations such as IoT network architect, 5G engineer, edge computing integrator, cloud security specialist, drone automation engineer or XR content specialist.

- Further advances in artificial intelligence and data create new roles and specializations such as automation architect, machine learning analyst, AI ethicist, data scientist or data loss prevention security engineer.

- Digital transformation creates industry transitions using fintech, agtech, edtech, greentech, proptech, etc.

- People skills for an internet context will take on a new importance as distributed teams rely more on remote collaboration.

- Health, safety and employee well-being are new priorities since the pandemic. That may lead to new roles devoted to those issues and new subjects that L&D will be responsible for addressing with all workers.

"Over-spec-ing" job opening requirements continues to be an issue

HR perceptions of industry-recognized tech certifications

Net 88% of HR professionals indicate "over-spec-ing" job opening requirements is an issue on some level

Common issue – likely to continue

32%

56%

Unsure

5%

7%

Not that common of an issue

Somewhat common issue – that employers are becoming more aware of and more intent on addressing

CompTIA's CyberSeek workforce analytics site confirms "over-spec-ing" is especially prevalent in cybersecurity job roles. The most egregious example entails employers seeking advanced cybersecurity certifications – often requiring 10+ years of managerial work experience, for entry-level positions.

Faint signals and mixed signals: Potential trends that are less clear

LAST YEAR	THIS YEAR

In last year's Workforce and Learning Trends report, we noted a few potential trends that we listened for but where the signals were mixed.

Meanwhile, we expected to encounter more discussion of these important factors in workforce development than we did.

VR and AR for training
While there continues to be a degree of interest, there isn't overwhelming momentum. A few interesting examples can be observed where VR is used to simulate experiences in the building trades or on the shop floor. For example, Hyundai created a VR version of its power-train factory so clients at Alabama's state workforce development agency can explore.[38]

Gamification
Examples of this can be spotted occasionally, like the consulting firm PwC using trivia game apps to onboard interns.[39] Otherwise we don't see this as a powerful trend in L&D.

Automation's impact on skills requirements and training
Last year we said it wasn't yet clear that automation was having a big influence on what skills were needed and how training is delivered. It did become very clear in the meantime, and this topic was essentially promoted to one of the main trends in this year's report. (See section 5.)

The multigenerational workforce
This perennial concern seemed to disappear from L&D publications. Perhaps that is an effect of the pandemic as other priorities emerged.

Blended or hybrid learning
This formerly buzzy topic rarely came up in L&D publications in the last year (though it was a constant concern in K-12 and higher education). Again, this might be an effect of the pandemic. With so much face-to-face training shut down, there wasn't much to blend.

Algorithmic accountability and algorithmic bias
Awareness of and concern about this subject does seem to be growing, but it's not going by that terminology. Without specifically describing it as algorithmic bias, most comprehensive discussions of DEI and of AI refer to the importance of ensuring new tools don't inherit and pass on biases from the individuals who built them or the data sets they rely on.

Faint signals and mixed signals: Potential trends that are less clear (cont'd)

Lastly, we picked up faint signals about what could emerge as significant factors in the near future.

Robotic Process Automation (RPA)

As more work processes become digitized, they become candidates for software that ties processes together and automates them. Gartner predicts the RPA software sector will grow to $2 billion this year.[40]

Model drift

AI systems need updating or they risk becoming less reliable over time. Model drift occurs when newly generated data influencing an AI looks less like the data it was trained on. (Presumably, the way we work during a pandemic has been generating a lot of data variation.) IT professionals will need to learn to spot and correct for model drift.

No code/low code

Software that enables building new digital services with minimal coding know-how has mostly been offered to individuals creating unique applications. But as more enterprise applications emerge that allow users to customize and optimize the software they use without the direct support of IT, it will impact the work of L&D.

FinOps

This is the emerging term for cloud financial management, which will become more important as cloud services become both significant cost centers and strategic necessities. FinOps specialists tune a company's cloud resources to minimize expense and maximize the speed and effectiveness of its operations.

Environmental, social and governance (ESG)

A large number of global companies are operationalizing corporate social responsibility principles by committing to ESG metrics in diversity, pay equity, worker health and social impact. Many ESG plans specify metrics in upskilling, reskilling and retention. As ESG transitions from theory to practice, it could influence how L&D participates in cultivating a corporate culture.

Now For the Hard Part

T he above trends don't operate independently. They overlap, reinforce or even act as a rate limit on one another. For example, progress on DEI is achieved when there are better career pathways, but automation may exacerbate existing inequalities in some fields. Continuous learning supports worker resilience, but some roles have clearer pathways than others to emerging opportunities.

Because our survey of 400 HR leaders covered the U.S. economy broadly, it offers a generalized perspective of their challenges and plans. On the ground, those challenges and plans will differ by industry and by job role. An IT worker in the whipsawed airline industry and another in ecommerce will need resilience for different reasons. A DEI initiative in a company starting from a low baseline of diversity will differ from one in a company with high churn rates. Product divisions fighting for share in a mature market will have different upskilling needs from colleagues trying to staff up for a land rush in an emerging market.
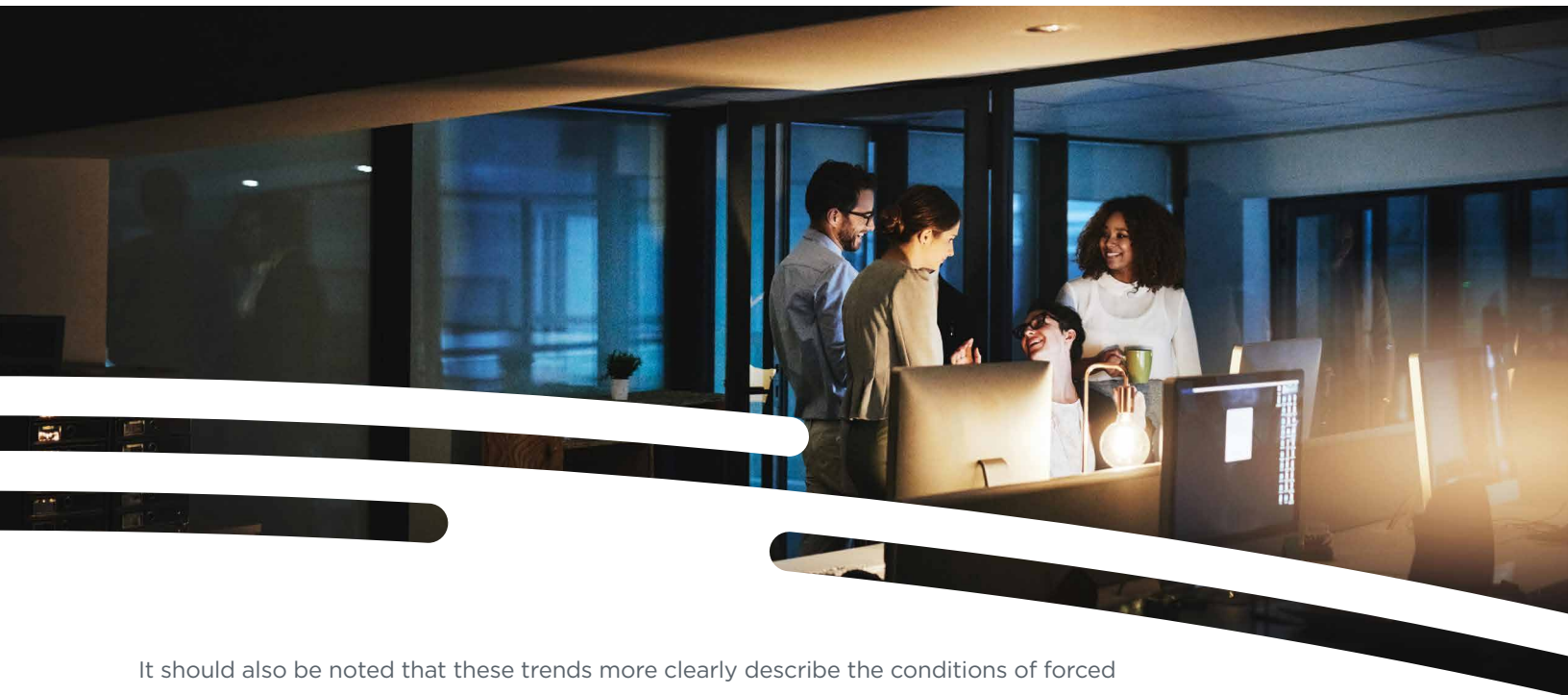
It should also be noted that these trends more clearly describe the conditions of forced necessity than how to respond. (The resources noted in the appendix are one place to start.) Upgrading technology is often the least challenging part. Much more challenging is synchronizing those upgrades with the required strategy changes, process changes and upskilling.

The last year has shown that the one universal choice facing every business is to expect the unexpected. That's necessary for survival and for being ready to accelerate through the curve. Our research shows that companies that are serious about expecting the unexpected are emphasizing worker resilience, proactive DEI, continuous learning, ever more extensive career pathways and human-digital teamwork.

Appendix

Trends from CompTIA's Workforce and Learning Trends 2020: Meet the "New Traditional" Models

1 The pace of change requires agility on many fronts

2 L&D increasingly shapes strategic direction, but resources don't always follow

3 A soft skills gap is bringing a new focus on challenges and solutions

4 Subject-matter experts remain core to the learning experience

5 Talent shortages push the reskilling and upskilling envelope

6 L&D aspires to create the seamless, blended experiences learners expect

Methodology

CompTIA's *Workforce and Learning Trends 2021* report leveraged a number of inputs to produce the final output. The quantitative component of the study consisted of an online survey fielded to U.S. HR and L&D professionals across a range of industry sectors and company sizes. A total of 400 respondents participated in the survey, yielding an approximated overall margin of sampling error at 95% confidence of +/- 5.0 percentage points. Sampling error is larger for subgroups of the data. Data was collected during January 2021.

As with any survey, sampling error is only one source of possible error. While non-sampling error cannot be accurately calculated, precautionary steps were taken in all phases of the survey design, collection and processing of the data to minimize its influence.

The qualitative component of the study consisted of 1:1 interviews with experts spanning the fields of learning and development, certifications, edtech and more. Third-party research and literature searches provided additional context.

CompTIA is a member of the market research industry's Insights Association and adheres to its internationally respected Code of Standards. Any questions regarding the study should be directed to CompTIA Research and Market Intelligence staff at research@comptia.org.

Credits

Content development by Robert McGuire of McGuire Editorial Content Marketing Agency.

About CompTIA

The Computing Technology Industry Association (CompTIA) is a leading voice and advocate for the $5 trillion global information technology ecosystem; and the estimated 75 million industry and tech professionals who design, implement, manage, and safeguard the technology that powers the world's economy. Through education, training, certifications, advocacy, philanthropy, and market research, CompTIA is the hub for advancing the tech industry and its workforce.

CompTIA is the world's leading vendor-neutral IT certifying body with more than 2.8 million certifications earned through rigorous, performance-based exams. CompTIA sets the standard for preparing entry-level candidates through expert-level professionals to succeed at all stages of their career in technology. Through CompTIA's philanthropic arm, CompTIA develops innovative on-ramps and career pathways to expand opportunities to populations that traditionally have been under-represented in the information technology workforce.

CompTIA Technology Career Pathway Roadmap

CompTIA Certifications Job Match

CompTIA Training and Learning

CompTIA Tech Career Academy

CompTIA IT Salary Calculator

CompTIA Member Communities and Councils

Sources

1   CompTIA, CompTIA Tech Jobs Report, March 2021

2   CompTIA, CompTIA Cyberstates 2021, March 2021

3   ibid

4   ibid

5   Accenture, It's Learning. Just Not As We Know It, September 18, 2018

6   World Economic Forum, The Future of Jobs Forum 2020, October 2020

7   ibid

8   ibid

9   CompTIA, unpublished survey of U.S. HR professionals, January 2021

10 ibid

11 National Fund for Workforce Solutions, Race and the Work of the Future: Advancing Workforce Equity In the United States, November 12, 2020

12 Citrix, Talent Accelerator, 2020

13 World Economic Forum, Resetting the Future of Work Agenda: Disruption and Renewal in a Post-COVID World, October 2020

14 CNBC, Google Is Tackling Mental Health Challenges Among Employees Through 'Resilience Training' Videos, Nov. 27, 2020

15 Udemy, The 2020 Workplace Learning Trends Report, November 2020

16 Brookings Institution, Visualizing Vulnerable Jobs Across America: A Tool to Understand Your Local Economy and Inform Its Recovery, July 28, 2020

17 Center for American Progress, The Economic Fallout of the Coronavirus for People of Color, April 14, 2020

18 ProPublica, What Coronavirus Job Losses Reveal About Racism in America, July 20, 2020

19 AARP, Unemployment's Toll On Older Workers Is Worst in Half a Century, October 21, 2020

20 Pew Research Center, Fewer Mothers and Fathers in U.S. Are Working Due to COVID-19 Downturn; Those at Work Have Cut Hours, October 22, 2020

21 Pew Research Center, A Rising Share of Working Parents in the U.S. Say It's Been Difficult to Handle Child Care During the Pandemic, January 26, 2021

22 Center for American Progress, How COVID-19 Sent Women's Workforce Progress Backward, October 30, 2020

23 World Economic Forum, World Economic Forum Launches Coalition to Tackle Racism in the Workplace, January 25, 2021

24 Nasdaq, Nasdaq to Advance Diversity Through New Proposed Listing Requirements, December 1, 2020

25 Willis Towers Watson, 4 in 5 Companies Planning to Change ESG Measures in Executive Pay Plans Over Next 3 Years, Willis Towers Watson Survey Finds, December 9, 2020

26 Josh Bersin, HR Predictions for 2021

27 Monmouth University, Protestors' Anger Justified Even If Actions May Not Be, June 2, 2020

28 National Fund for Workforce Solutions, Race and the Work of the Future: Advancing Workforce Equity in the United States, November 12, 2020

29 Josh Bersin, The Big Reset Research, November 2020

30 Randstad, Randstad Workmonitor: 2020 Report, December 2020

31 Burning Glass, Skills of Mass Disruption: Pinpointing the 10 Most Disruptive Skills in Tech, December 2020

32 Amazon.com, New Amazon Program Offers Free Career Training in Robotics, January 27, 2021

33 CompTIA, New Effort Underway to Expand and Diversify Apprenticeship Opportunities in the U.S. Technology Workforce, November 23, 2020

34 World Economic Forum, The Future of Jobs Report 2020, October 20, 2020

35 Deloitte, 2021 Global Human Capital Trends, December 9, 2020

36 Citrix, Work 2035: How People and Technology Will Pioneer New Ways of Working, September 19, 2020

37 McKinsey & Company, What 800 Executives Envision for the Postpandemic Workforce, September 23, 2020

38 Business Wire, Hyundai Launches VR Training Initiative to Grow Manufacturing Talent in Alabama, February 2, 2021

39 HRDive, How PwC Uses Gamification to Support Learning, Engagement, July 28, 2020

40 Gartner, Gartner Says Worldwide Robotic Process Automation Software Revenue to Reach Nearly $2 Billion in 2021, September 21, 2020

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