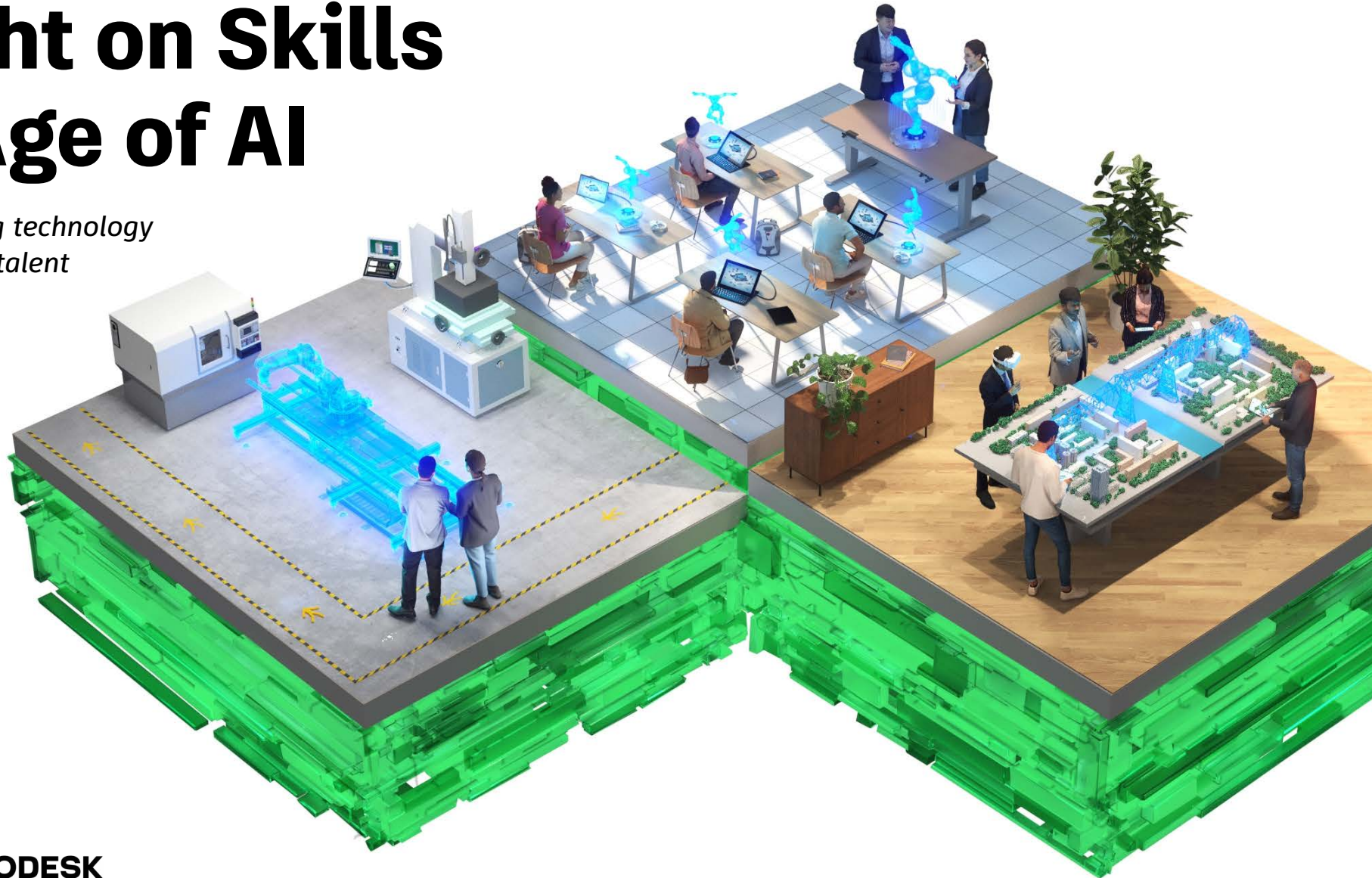


A STATE OF DESIGN & MAKE SPECIAL EDITION

Spotlight on Skills in the Age of AI

*The impact of emerging technology
on skills, training, and talent*



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Introduction

No longer a fringe consideration, artificial intelligence (AI) has become a strategic priority for businesses across industries. According to Autodesk's 2024 State of Design & Make survey, 77% of business leaders said they will continue their AI and emerging tech investments over the next three years, with 32% classifying these investments as "strong." Yet while many are eager for the results of this rapid wave of innovation, much of the execution hinges on a workforce that lacks the specific skills needed to deliver on the true promise that AI stands to offer.

According to the World Economic Forum, technological progress, economic shifts, and sustainability initiatives will change nearly one-fourth of the world's jobs by 2027: 83 million existing jobs will be displaced, and 69 million new jobs will be created. Although this projection nets a loss of 14 million jobs, the nearly 70 million new jobs that will be created reflect the reality of tomorrow's workforce—a reality that many young adults entering the job market aren't prepared for.

Why? The quick momentum of tech advancement has outpaced the transformation needed to prepare students and young adults for tomorrow's jobs. And while this is already evident

in certain industries, the implications are going to become sharper and more widespread in the years to come.

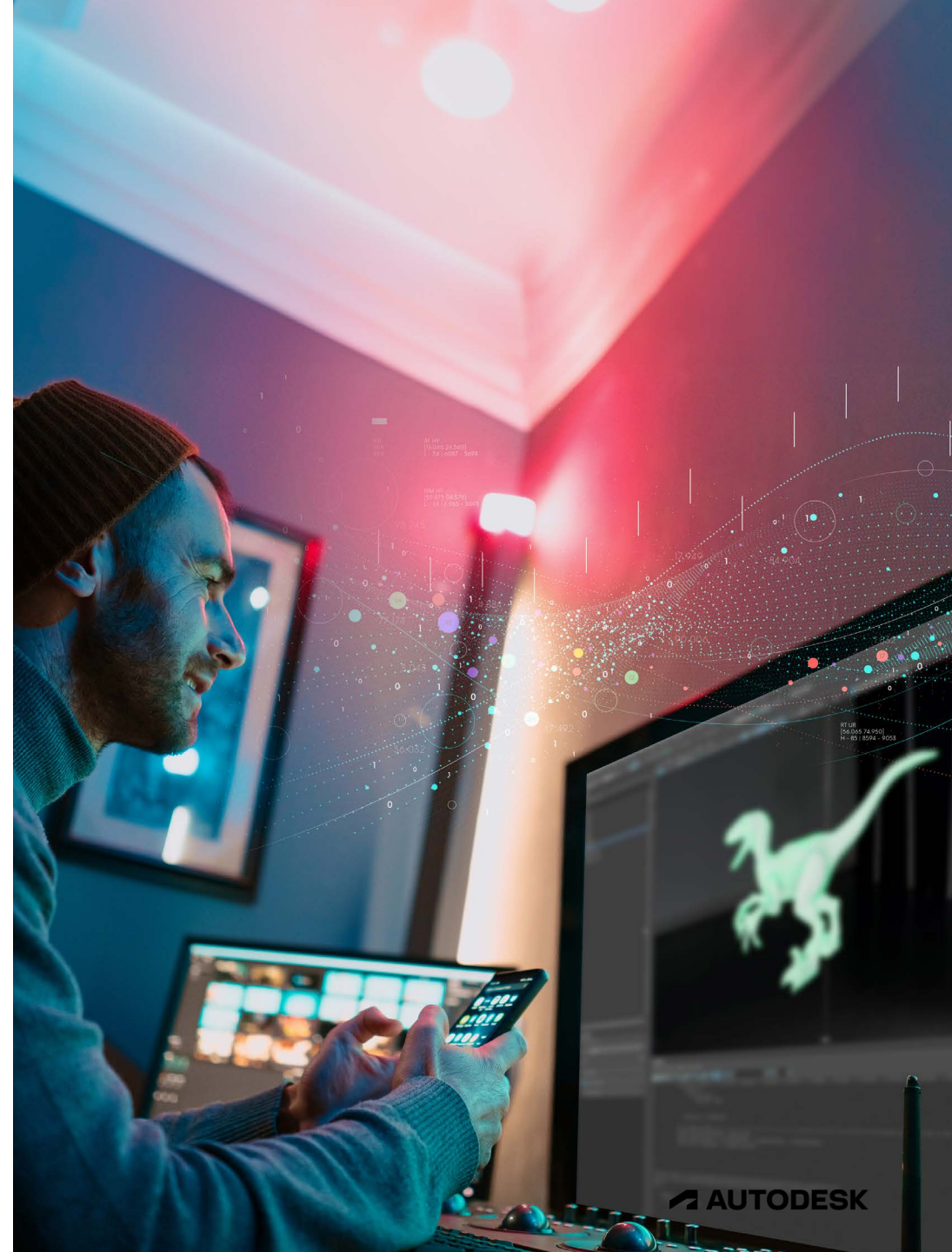
"How do we get AI to be more integrated into education?" asks Manny Rodriguez, founder and executive director of Revolution Workshop, a Chicago-based nonprofit social enterprise focused on skills, hope, and resilience. "I think it's going to take a village to do that. It's going to take the collaborative effort of nonprofits, schools, other education or training institutions, business employers, and technology."

The impact of AI and the scarcity of “soft skills” across Design and Make industries

While some industries have yet to fully embrace the power of AI, others are well beyond the planning phase. Across Design and Make industries—architecture, engineering, construction, and operations (AECO); design and manufacturing (D&M); and media and entertainment (M&E)—data from Autodesk’s 2024 *Skills in the age of AI* survey shows that the growing availability and usage of AI tools is having an impact on how organizations approach hiring new talent and reskilling or upskilling their current workforce.

At the industry level, AI tools have had the greatest impact on the design and manufacturing landscape, as 71% of the respondents in D&M already rank the ability to work with AI as a top skill, compared to 67% in M&E and 57% in AECO. This has the greatest implications for manufacturing and production engineers, with 56% and 52% of respondents, respectively, anticipating their jobs will be affected by AI.

Despite the escalating need for AI skills across industries, there is no sentiment suggesting that emerging technologies will supplant humans in the workforce. Humans will, however, need to be prepared for an AI-infused workforce—one that requires a different set of skills than perhaps was needed just a few short years ago.



SECTION 1

“I don’t think AI is going to kill everyone’s job,” says Bob Gallo, senior vice president, Power Construction Co. “It might make automation a little more cost competitive, but automation is still very expensive. So, might we see AI replace some really basic tasks because technology finds a way to do it more economically? Sure.”

In addition to being prepared to lean into emerging technologies, tomorrow’s workforce needs more than just a solid grasp on the teachable abilities that are applicable for specific Design and Make career paths. These “hard skills,” while important, have taken a back seat to the interpersonal skills that help people get along with one another, communicate effectively, and better adapt to a changing business landscape. They’re also in short supply.

“Technical skills aren’t hard to find,” says Blaine Buenger, technology director, infrastructure group, Foth. “We hire some really smart people, and we can teach them anything with technical skills, or technology skills, and how to do things. The hardest for us is the soft skills, communication, things like being a team member, just asking questions when you need help.”

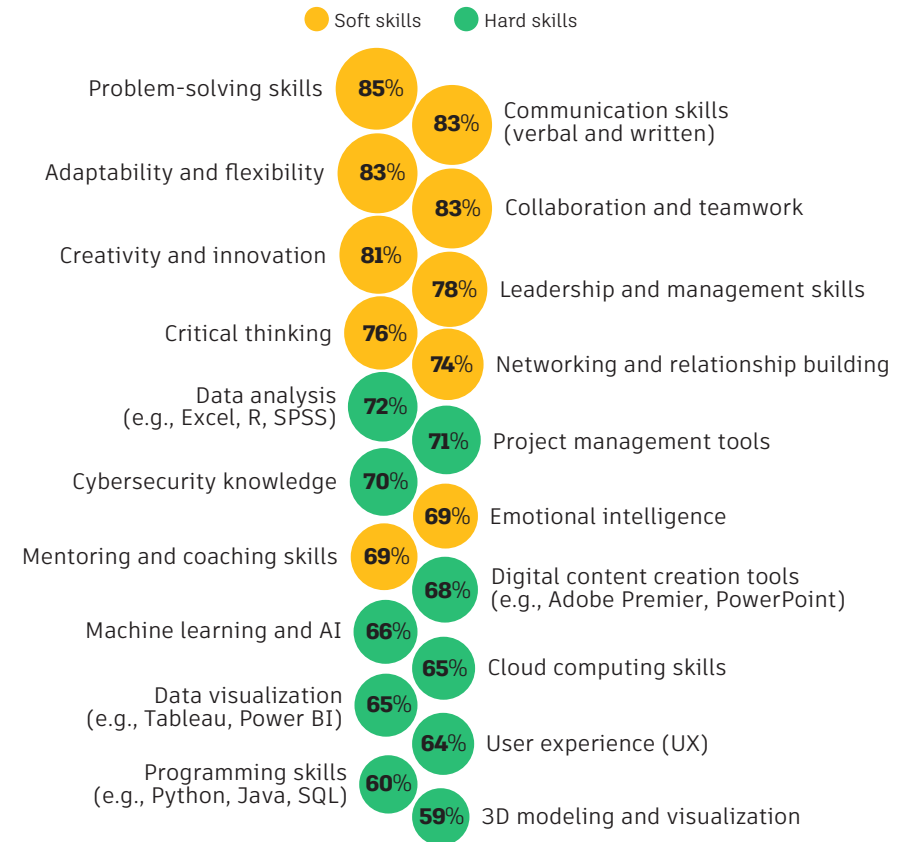
The somewhat nebulous nature of “soft skills” like mentoring, critical thinking, adaptability, and leadership makes them more difficult to teach, but they’ve become highly valued by employers across industries.

“In some ways, I’m looking more for soft skills than technical skills at this point,” says Racel Amour, head of generative AI, AEC, at Autodesk. “We think that technology or technical skills can be more easily acquired over time with experience, but people’s soft skills—like communication, aptitude to learn, and to drive various initiatives—are more difficult to teach.”

Problem-solving skills are the most important soft skills that businesses are looking for, significantly more important than data analysis, the most desired hard skill.

Employers value soft skills over technical skills

Problem-solving and communication are seen as critical for success

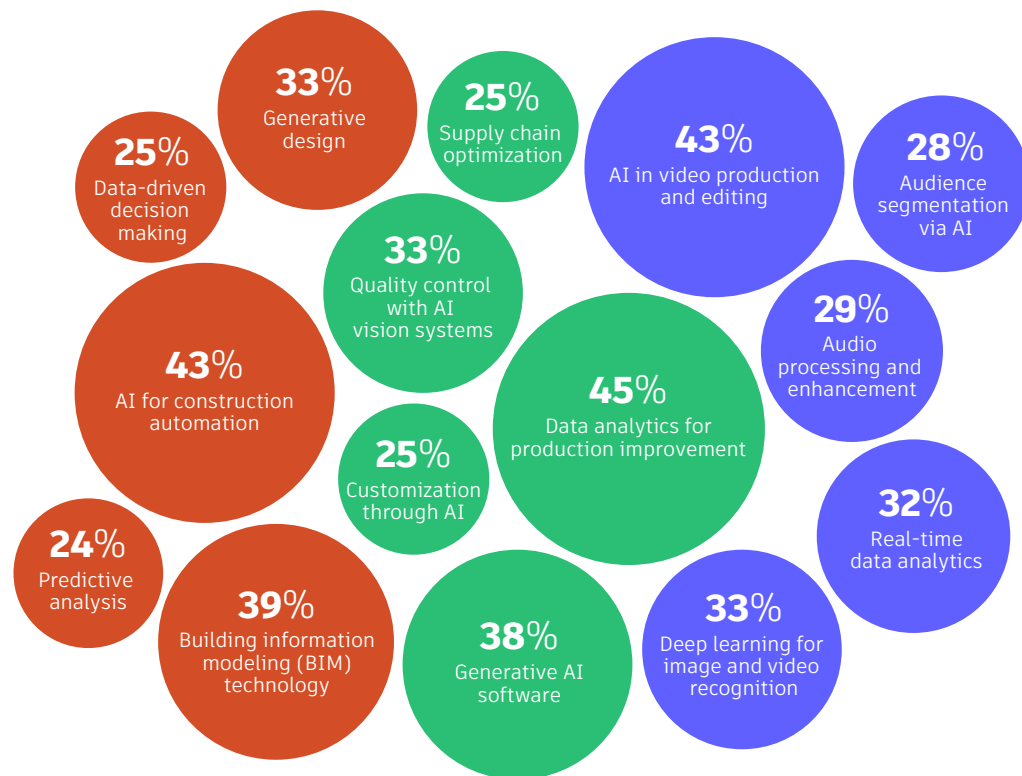


How important are the following technical/soft competencies for professionals to have success in the current and future job markets? 5-point scale. Top two = important.

AI specializations are growing

Data skills are in demand across industries

● Architecture, engineering, construction, and operations ● Design and manufacturing ● Media and entertainment



Survey question: When looking for employees with AI skills, which competencies do you find most important? Please select up to 3 options.

The AI skills gap is growing

Now firmly rooted in both the growth strategies of the world's most future-focused companies and the zeitgeist of pop culture, AI is suddenly everywhere, and it's creating a skills gap between demand and supply. Demand for AI-related skills is rising as business leaders seek to boost productivity, optimize efficiencies, and bolster the bottom line, but employers are struggling to find workers with the right skills.

"I think skills training is paramount to business success going forward," says Lee Pratt, advanced manufacturing skills academy manager at the University of Wales, Trinity Saint David. "Technology is evolving on a daily basis. Students need to commit to that evolutionary process within the business, or, otherwise, they're going to get left behind in a very short space of time."

From a macro perspective, the gap is significant. According to Autodesk's 2024 *State of Design & Make* survey, 45% of employers across industries are struggling to find candidates with the right technical skills. And given the growing focus on AI skills in the workplace, 65% of firms across Design and Make industries say AI skills are either very or extremely important. To bridge the skills the gap, 35% of business leaders say they're using AI.

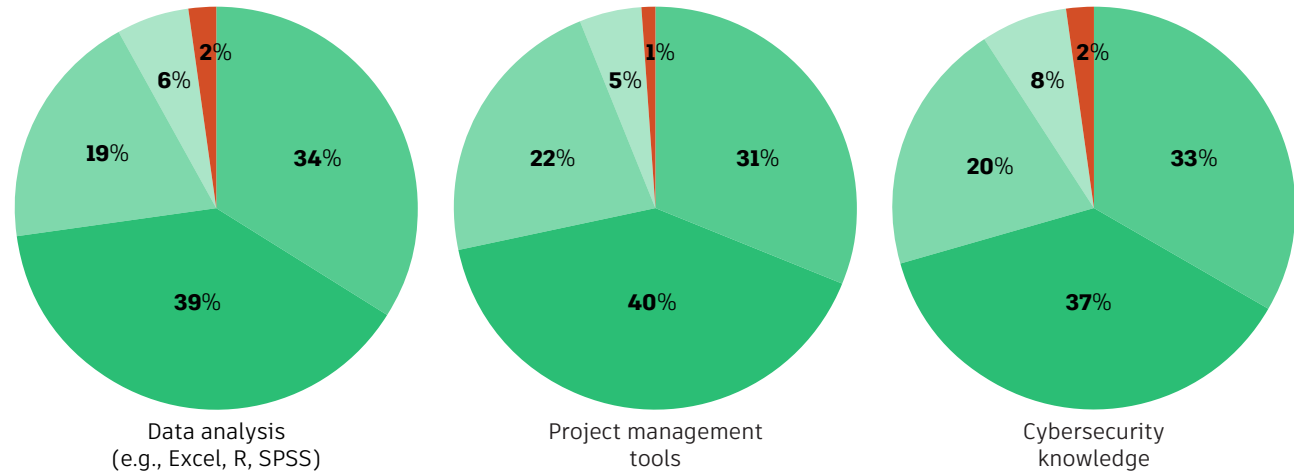
SECTION 2

Among the competencies recruiters are looking for, machine learning and AI skills are not yet at the top of the list, but their level of importance nearly rivals data analysis and project management. And in countries such as China, India, France, and Germany, the importance of AI skills is significantly higher than the global average (89%, 81%, 80%, 75%, respectively).

“AI isn’t going to just do your work for you,” says Pete Mylon, senior university teacher within the engineering faculty at the University of Sheffield. “But it can be a tool to make it easier to find information, to interrogate things, distill information, provide the summary points. That’s where it’s useful.”

Data analysis is the most relevant job competency for success, say business leaders

● Extremely important ● Very important ● Moderately important ● Slightly important ● Not at all important

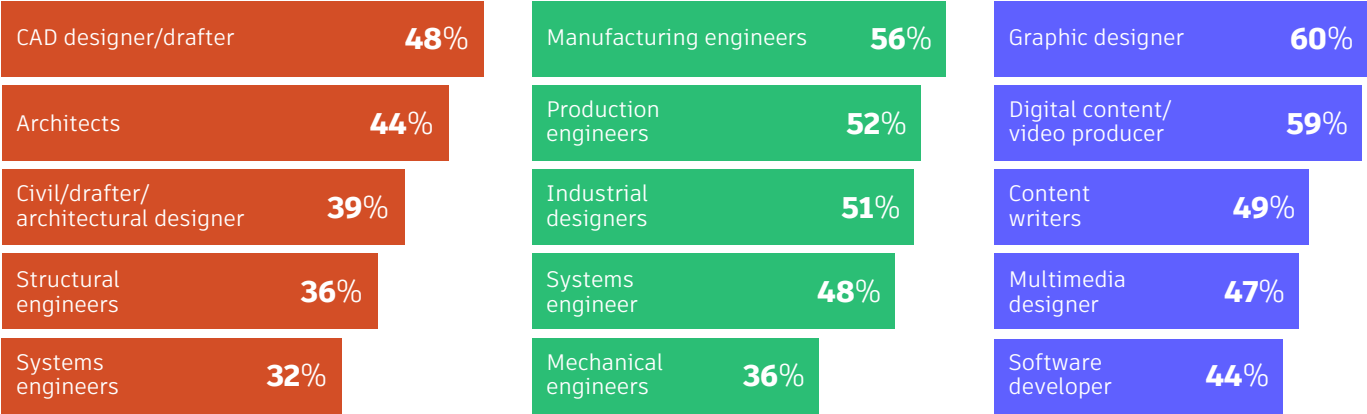


Survey question: How important are the following technical competencies for professionals to have success in the current and future job markets? 5-point scale.

CAD, graphic design, manufacturing engineering feel the strongest impact from AI

AI is affecting jobs across industries

● Architecture, engineering, construction, and operations ● Design and manufacturing ● Media and entertainment



Within D&M, data analytics, generative AI, and quality control are the top three most relevant AI skills, with manufacturing engineers, production engineers, and industrial designers being the three jobs most affected by AI. Within M&E, AI has the biggest impact on graphic design and content production. In AECO, the implications are highest for CAD designers and architects.

“I’m most excited about everything we’ve got around us now—this cutting-edge technology and how achievable it is,” says Pratt of the University of Wales, Trinity Saint David. “With a very limited amount of training, you can manufacture components these days with 3D printing, from your bedroom if you want.”

While AI, neural networks, and machine learning have become more widely applicable in Design and Make industries as technology has improved, the broader realm of emerging technologies spans everything from robotics to visual image recognition to natural language processing.

Survey question: Which job types/functions do you anticipate will be affected in your industry as a result of AI and emerging technology. Please select all that apply.

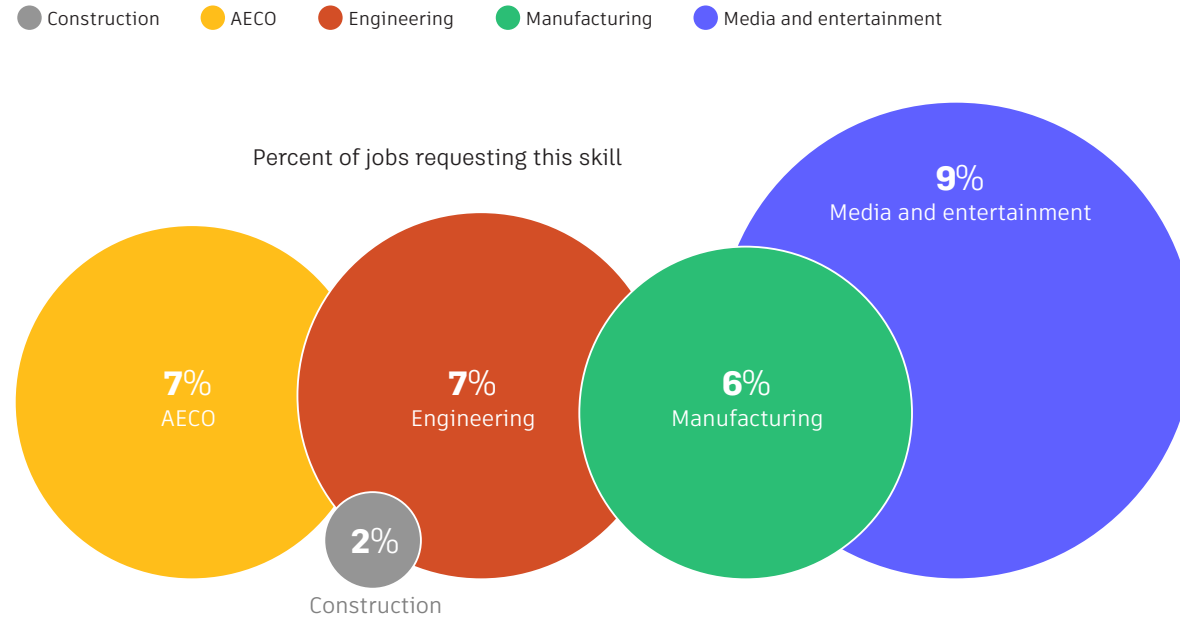
SECTION 2

The skills for each and their business applications vary, as does the demand for these skills in the job market. Automation skills, however, are of importance across all industries, especially in media and entertainment. In fact, 2024 data from labor market and analytics firm Lightcast shows that M&E demand for automation skills is more than 20% higher than in other industries, with nearly 9% of total job postings now requesting this skill among applicants.

The implications of this skills gap are significant, and they could cause more of a shift in the balance of the workforce than many currently expect.

Automation is growing as a skill set across Design and Make industries

Media and entertainment sees the biggest need



Source: Lightcast, October 2024

The intersection of AI and sustainability

While perhaps less present in news headlines and corporate marketing following COVID-19, sustainability remains a top priority for businesses around the world, and that importance is on the rise. Recent research from Capgemini found that sustainability in 2024 is a bigger priority for businesses than it was in 2022 and 2023, noting that 52% of organizations are expected to increase their sustainability investments this year. And according to Autodesk's 2024 *State of Design & Make* report, 97% of organizations have taken actions to improve sustainability.

Sustainability is important **for business development** and **employee retention**.



Findings from Autodesk's 2024 *Skills in the Age of AI* survey amplify these findings, with respondents noting the importance of sustainability at their organizations over the coming few years.

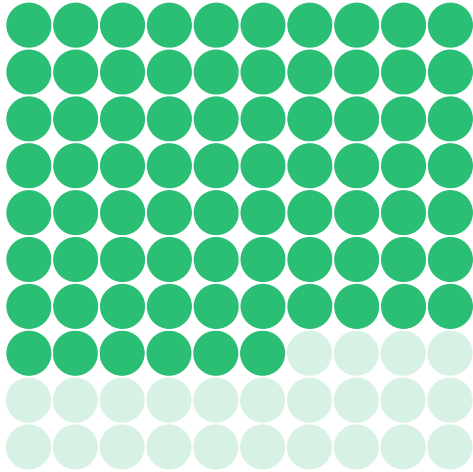
Leaders also highlight the vital nature of understanding sustainable business

practices for career success over the next decade. Survey results highlight the importance of sustainability among employees: 72% of business leaders believe that an organization's sustainability efforts promote talent retention.

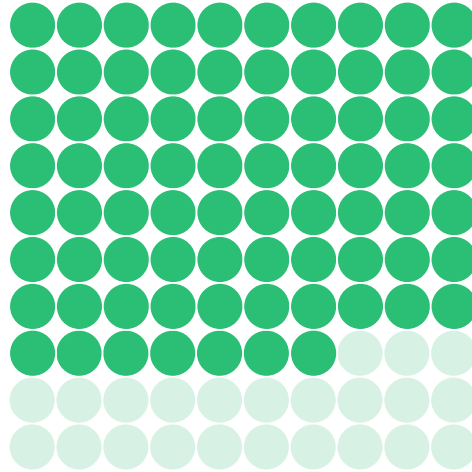
Sustainability skills are crucial for business success

The rise of sustainability initiatives requires new skills

76% say sustainability is very or extremely important for their organization in the next few years



77% believe understanding sustainable business practices will be very or extremely important for career success in the next decade



Source: Autodesk *Skills in the Age of AI* survey, 2024

CONVERGENCE: SUSTAINABILITY AND AI

AI will play a key role in advancing the sustainability goals of many organizations in the coming years. Given the rising importance of sustainability and the emerging use cases for new technologies, AI has grown to be the top enabler of sustainability for 34% of organizations, according to Autodesk's *2024 State of Design & Make* report.

In addition to accelerating innovation in Design and Make industries, advancements in AI have the potential to reduce greenhouse gas emissions and advance climate adaptation. Amid mounting pressure from customers, employees, investors, and governments, companies are placing greater emphasis on decarbonizing their projects and processes.

Data is a catalyst for enabling more sustainable outcomes; it's critical to analyze scenarios, inform decisions, and drive efficiency.

By streamlining siloed workflows, delivering insights at critical stages, and enhancing overall project efficiency, AI-driven solutions are enabling organizations to redefine what's possible for a sustainable future.

Globally, China, Germany, and India are the most concerned with sustainability, but Autodesk's *2024 Skills in the Age of AI* survey highlights that employers in China and Germany are most likely to believe that AI skill sets will be the key to achieving their sustainability goals. Of respondents in these countries, 96% and 94%, respectively, somewhat or strongly agree that their organization has the skills they need to achieve their sustainability goals.

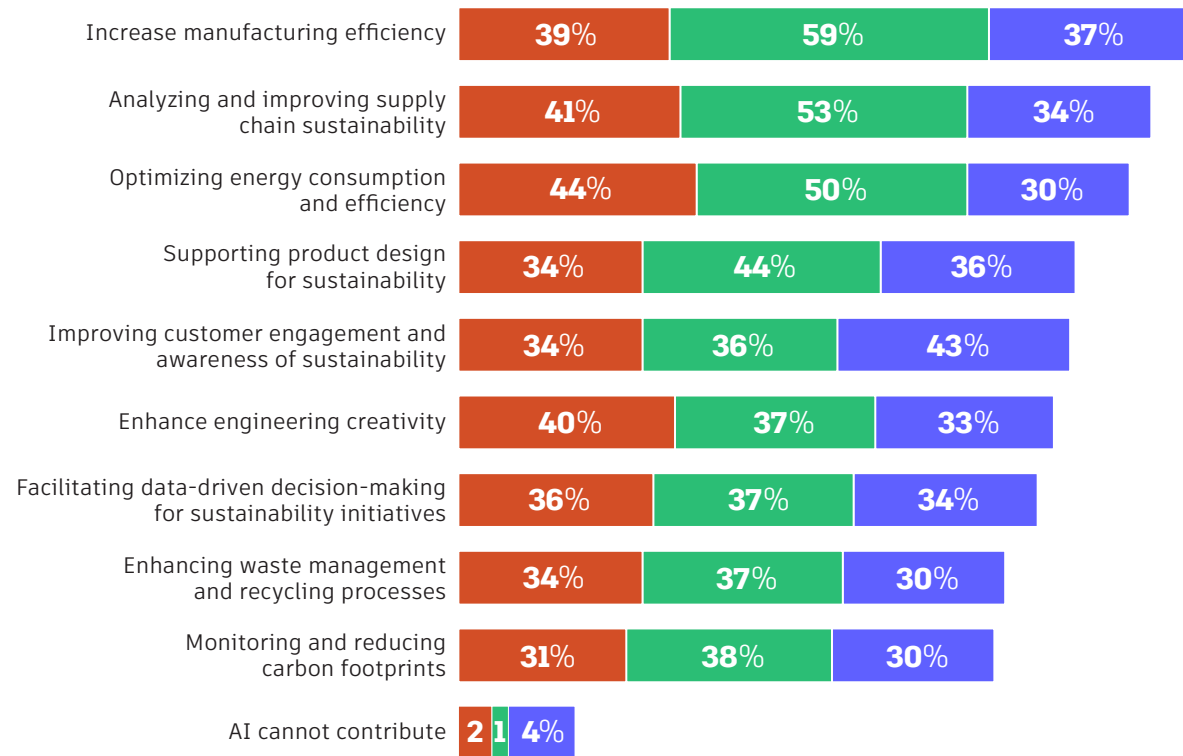
CONVERGENCE: SUSTAINABILITY AND AI

For young adults entering the workforce, the combination of AI skills and sustainable business practice knowledge holds significant promise. Seventy-seven percent of respondents in Autodesk's *2024 Skills in the Age of AI* survey say that sustainability is very or extremely important at their organization—nearly the same percentage (76%) who say that understanding sustainability practices will be very or extremely important in business in the coming years. The upside, however, is that an impressive 81% of leaders agree that they have the skills they need to achieve their organization's sustainability goals.

AI tools are helping organizations achieve their sustainability goals

Manufacturing and supply chain are seeing the biggest benefits

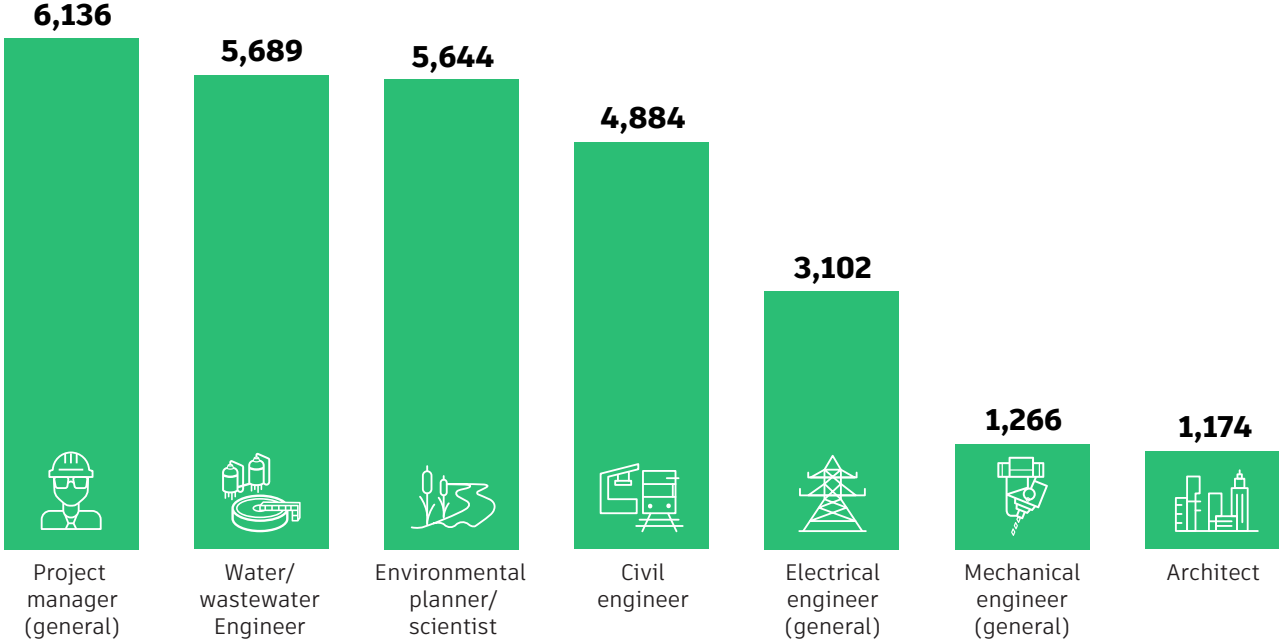
● Architecture, engineering, construction, and operations ● Design and manufacturing ● Media and entertainment



Survey question: How do you believe AI can contribute to achieving your organization's sustainability goals? Please select all that apply.

Green jobs in architecture

More than 39,000 open jobs in 2023 were in the green economy



Source: Lightcast, October 2024

“Our sustainability efforts most certainly attract talent,” says Mohamad Kassir, global BIM manager at Egis Group. “The workplace is an environment where we need to have shared values. And the work we’re doing toward sustainability differentiates us with the client as well as with attracting the right people.”

In 2023, approximately 18% of open jobs in the US architecture industry were in the green economy, according to Lightcast data. Importantly, the more than 39,000 open jobs were dispersed across a variety of job functions, highlighting the importance of green skills and the growing demands for a workforce with related skills and business knowledge.

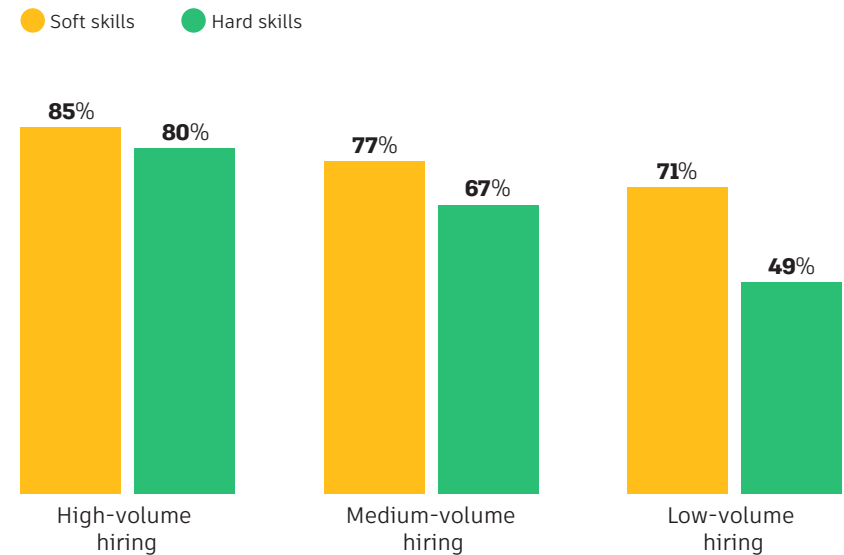
Soft skills are critical in the digital age, and so is upskilling

As noted earlier, soft skills trump hard skills in importance among today's business leaders and employers. In fact, soft skills are the top eight very or extremely important skills for new hires, according to Autodesk's 2024 Skills in the Age of AI survey. The emphasis on soft skills is also consistent across hiring volumes.

As a result, many organizations are incorporating soft skills in the training they provide to incoming employees. According to Autodesk's 2024 State of Design & Make survey, 71% of business leaders are implementing continuous learning programs, much of which covers digital and soft skills.

"We marry really well the technical and the soft skills," says Revolution Workshop's Rodriguez. "The technical stuff is pretty robust for entry level, but the real sweet sauce of it is that we also provide critical life skills and soft skills training. We do that in three pillars: financial capabilities, employability, and executive functioning."

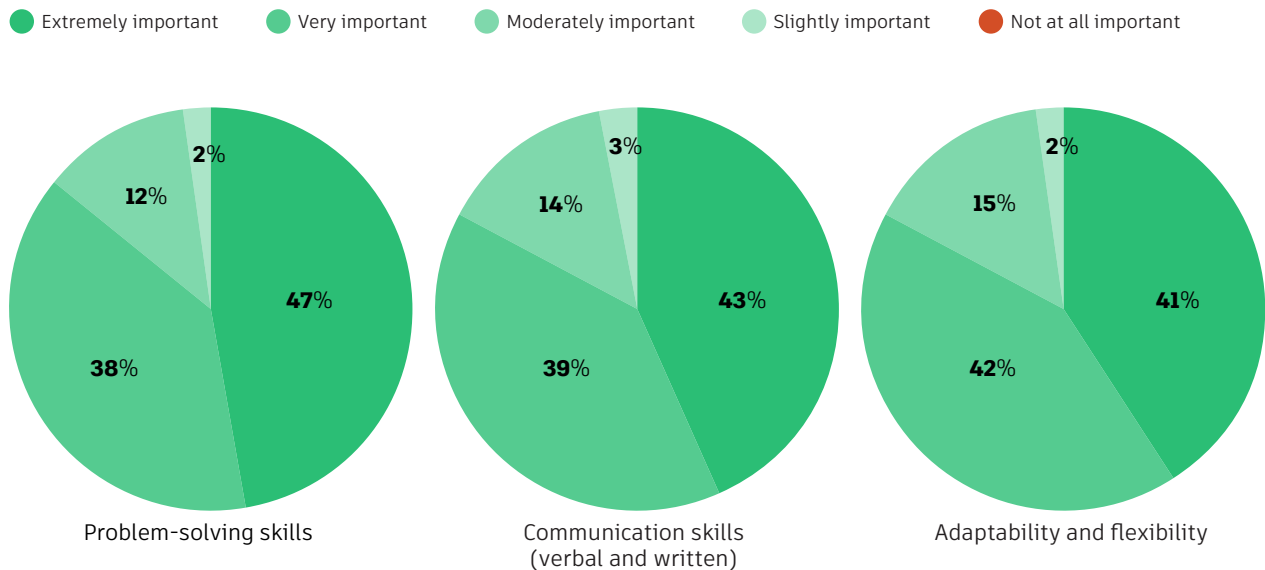
Soft skills are in demand regardless of hiring volume



Survey question: How important are the following technical/soft competencies for professionals to have success in the current and future job markets? 5-point scale. Top two = important, average for 10 soft and 10 hard skills. And survey question: How many people are you planning on hiring in the next three years? "51-100" and "More than 100" = High, "11-25" and "26-50" = Medium, "1-10" = Low.

Problem-solving skills are the key to success in Design and Make industries

Communication skills and adaptability are also in high demand



Survey question: Survey question: How important are the following Soft Skills for professionals to have success in the current and future job markets? 5-point scale.

SECTION 3

“We take a bespoke, tailored approach to our training, where we engage with industry, understand their key outcomes, and then we develop a program in line with them to develop their students as they see fit,” says Pratt of the University of Wales, Trinity Saint David.

According to Autodesk’s 2024 *State of Design & Make* survey, part of the challenge lies in the skill of the business to impart the necessary knowledge to incoming employees. Importantly, 77% of business leaders say that upskilling and job training are important, but 40% don’t know how to implement the right initiatives. That could be problematic in Design and Make industries, where cross-functional collaboration is often the norm, and it’s rare that individuals work on projects alone.

“Definitely, collaboration is a big skill because seldom do you work on your own,” says Timothy Whitehead, head of the Design Technology & Innovation department at Aston University Engineering Academy. “You’re part of a huge team. You’ve got people that you need to test ideas with. You’ve got line managers that need to be involved in the design and make process.”

Business leaders are big advocates of **upskilling**, but **more than one-third don’t know how** to implement the right efforts.

SECTION 3

Some organizations opt to partner with formal education programs to ensure that new hires have the right blend of hard and soft skills, as is the case at interior construction, building envelope, and insulation firm Lindner Group.

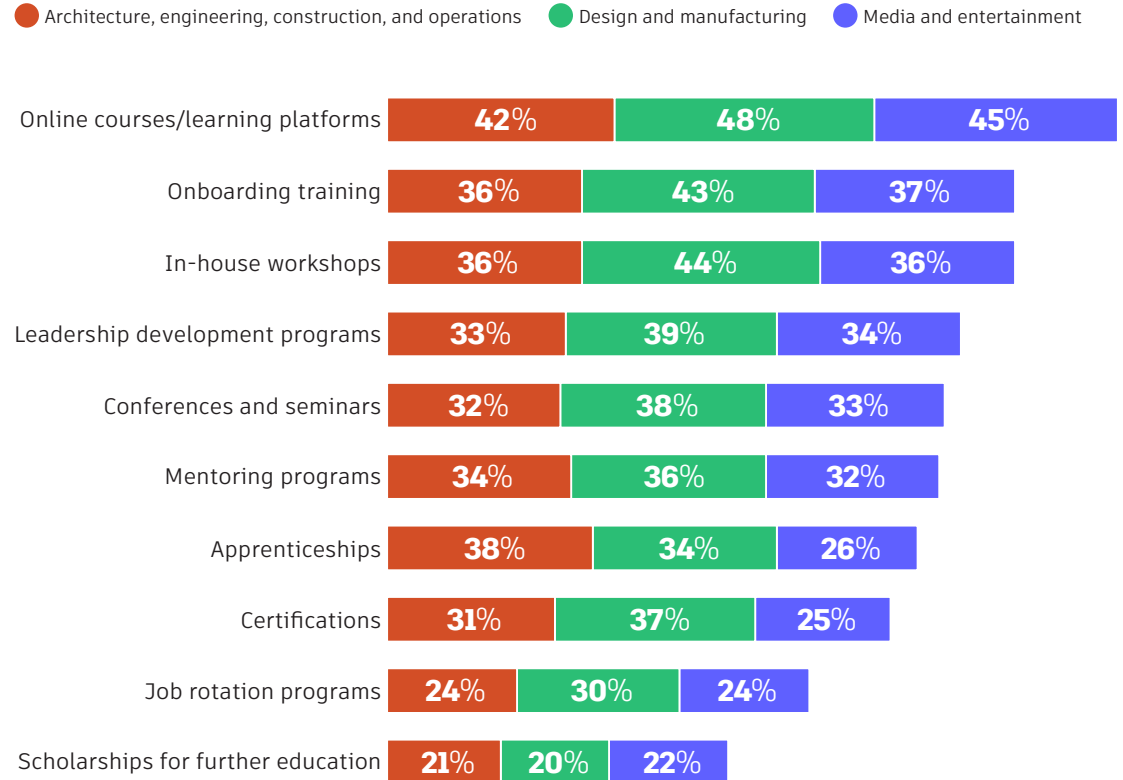
“The younger generation demonstrates a preference for online learning over traditional classroom instruction,” Buenger says. “They benefit from the flexibility to learn at their own pace, and we enhance their experience by pairing them with shadow partners to ensure comprehensive understanding. This approach has proven to be successful for us.”

And at Lindner Group, mentoring via shadow partner aligns with how Autodesk’s head of generative AI for AEC approaches on-the-job training, especially with respect to soft skills.

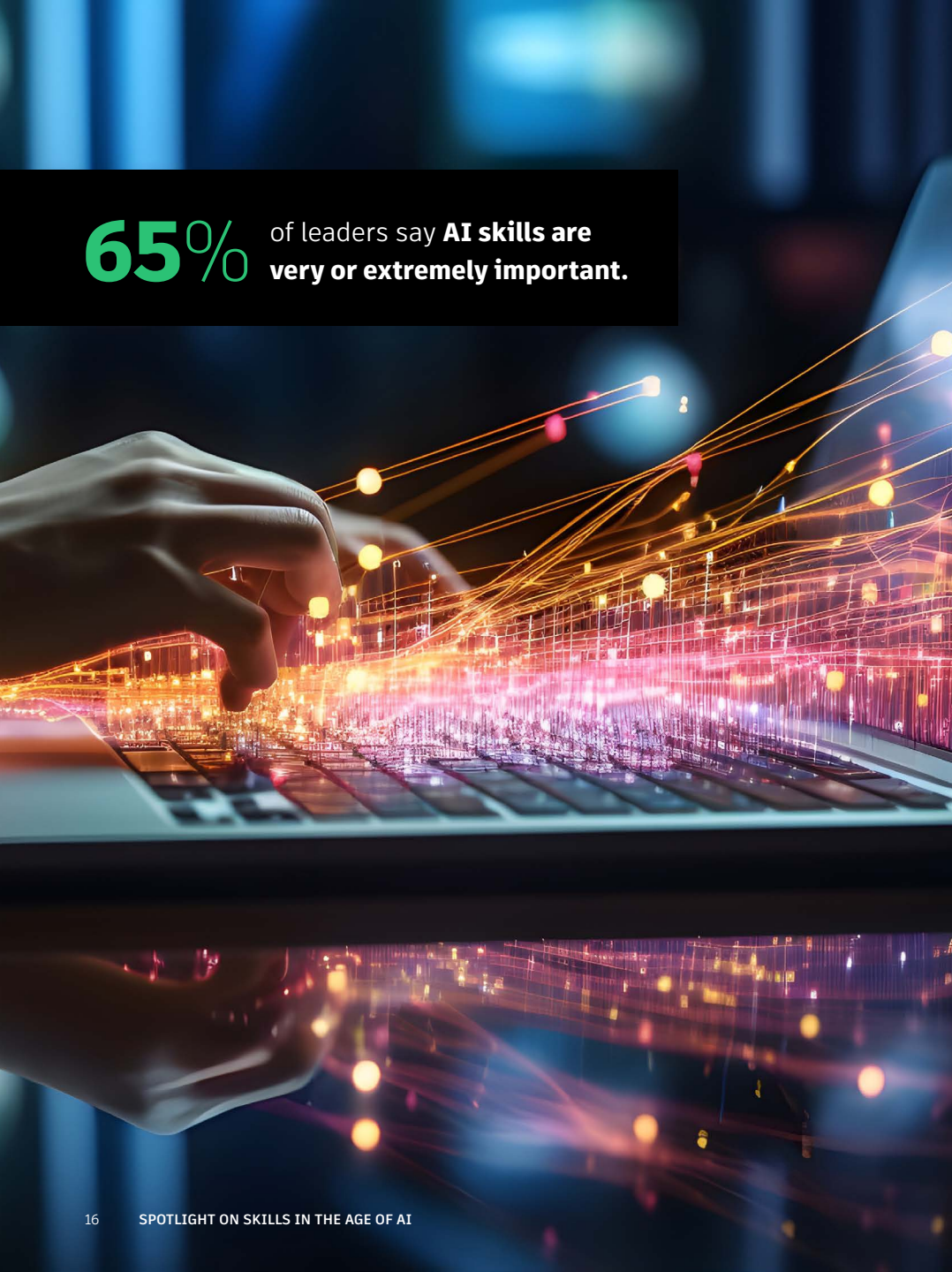
“I’m a true believer in mentoring people, and I’ve always had my own mentors,” Amour says. “Understanding people’s experiences and learning how to communicate your ideas is essential. That’s what it takes to work in an industry today, because it’s more about your connections with people and how you can communicate those ideas and get them to come to life. That’s what is going to measure your impact and your success. You can have all the technical skills in the world, but they will never make the thing come to life if you can’t communicate them.”

Online courses are the top choice for upskilling

Business leaders also favor in-house training and onboarding programs



Survey question: What types of training programs or professional development opportunities does your organization offer to enhance employees’ skills? Please select all that apply.

A hand is shown typing on a laptop keyboard. The background is a dark, futuristic digital space with glowing orange and yellow lines and dots, resembling a network or data stream. The lighting is primarily blue and purple, creating a high-tech atmosphere.

65% of leaders say **AI skills are very or extremely important.**

SECTION 3

Across Design and Make industries, leaders are turning to technology to help bridge both soft and hard skills gaps—73% of business leaders now report they plan to invest in digital skills training, up from 68% in 2023.

“In terms of upskilling programs, I think you will get your money back tenfold if you are trying to run a business,” Amour says. “Helping your workforce develop new skills is key to getting your business to run as successfully as you want it to.”

With respect to the ongoing education and training that’s needed to stay updated on tech advances and changes, business leaders rank the ability to adapt highest among strategies to stay informed. This strategy is particularly emphasized in India, where 52% of leaders say it’s the most relevant. In the UK, leaders believe attending workshops (46%) and participating in online courses (43%) are more important.

“I think the earlier we can introduce students to AI, it will hopefully ease the process of future adoption,” says Pratt of the University of Wales, Trinity Saint David.

To that end, some educators are leaning into new technologies—both for the benefit of the students as well as the way they teach.

“When I was a student, AI wasn’t hugely impactful,” says Eva Voma, teacher at Coleg Llandrillo. “But now, in the recent few years, it is massive. As a teacher, I can use AI in a good way to help me create a rough lesson plan. I would still need to tweak it myself, but it’s a good starting point. In the future, AI could help me create tutorials, help me to brainstorm ideas and come up with new and engaging teaching methods. If it could boost, rather than replace, human creativity, that would be great.”

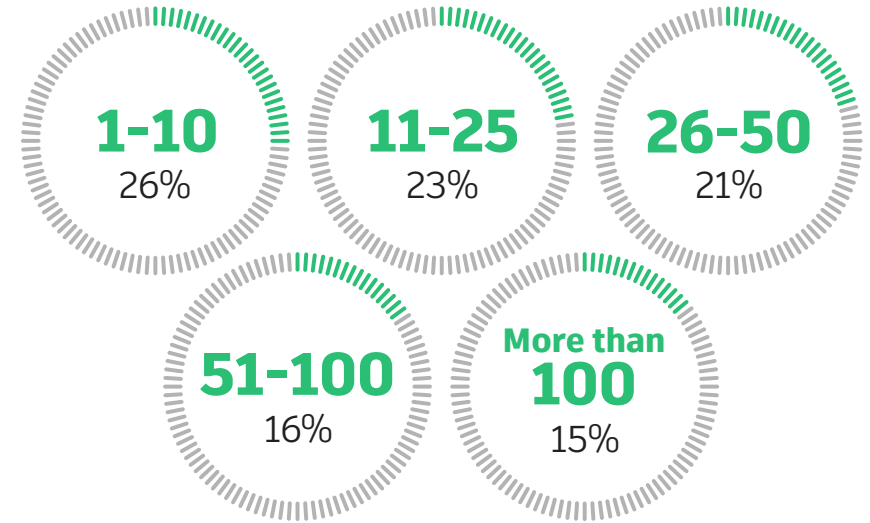
The future of work depends on partnerships

Massive advancements in AI in recent years aside, Design and Make industries are much closer to the starting point of the race than the finish line. That said, the key to pushing forward in the race is enabling tomorrow's workforce to capitalize on every potential that emerging technologies offer. To do that, business leaders and educators need to partner more closely to ensure that students are prepared for tomorrow's businesses.

"I think you will see an emerging trend of transformative partnerships between employers and educators," says Steelcase director of impact for people + planet Aileen Strickland McGee. "And I hope that, in five to 10 years, we see a lot more of that happening around these challenges."

Globally, the need for stronger partnerships with Design and Make industry leaders will likely be greater in markets where hiring levels will be highest: China, India, France, and Germany, according to *2024 Skills in the Age of AI* survey results. Across industries, planned hiring is highest in D&M and lowest in M&E.

Future hiring is varied across Design and Make industries



Survey question: How many people are you planning on hiring in the next three years?



SECTION 4

Several key motivators are at the heart of the need for larger workforces: growth and expansion, workload and demand, quality improvement, and turnover. AI and emerging technologies will be critical in several of these areas, especially when pace, efficiency, and automation can improve an organization's returns.

To be best prepared for the evolving needs of business today, business leaders think young people entering the workforce should be aware of emerging business strategies, as well as how to advance themselves as they begin their careers.

“When you're newly out from university, companies offer different educational programs internally depending on where in the organization you are,” says Linn Areno, head of construction and engineering solutions at Skanska. “For example, if you're working in buildings, you start out as a project engineer. There, you have certain steps that you have to go through internally to leverage your knowledge and develop in your position.”

And when it comes to entering the workforce, going in with as much practical experience as possible—especially experience that involves emerging technologies and emphasizes soft skills—can help new hires hit the ground running.

“Try to get internships; join research groups led by faculty members; volunteer in technical clubs or professional clubs,” says Peter Bishay, professor at California State University, Northridge. “And focus more on the opportunities directed toward the new technologies and the pillars of Industry 4.0.”

About *Spotlight on Skills in the Age of AI*

Data for the *Spotlight on Skills in the Age of AI* report was compiled from the Autodesk 2024 *Skills in the Age of AI* survey. This survey comprises 1,654 global industry leaders and experts in Australia, China, France, Germany, India, Italy, Japan, New Zealand, Spain, the United Kingdom, and the United States across Design and Make industries: architecture, engineering, construction, and operations; design and manufacturing; and media and entertainment. Data from Autodesk's [*2024 State of Design & Make*](#) report was also used.

For the purposes of the *Spotlight on Skills in the Age of AI* report, we also used industry and jobs data from Lightcast, a labor market and analytics firm.

The *Spotlight on Skills in the Age of AI* report includes qualitative interviews from leaders and experts across Design and Make industries.



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