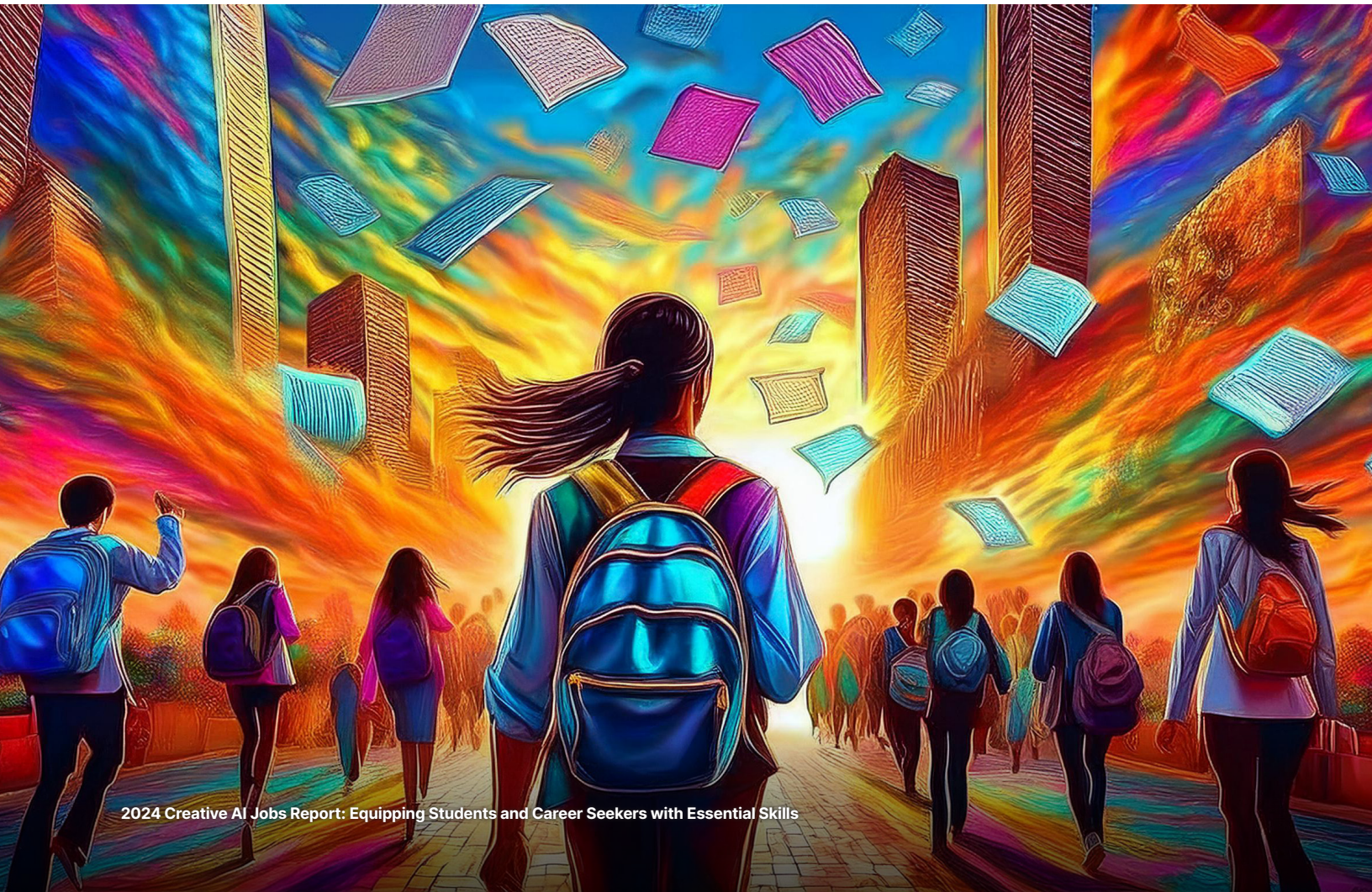
2024 Creative AI Jobs Report

Equipping students and early career seekers with essential skills

Edelman DXI x Adobe

Research conducted by Edelman, a global research and communications firm, in partnership with Adobe

Contents



Introduction

The future of work is here, and the creative and AI skills needed for industries, small businesses, and career-seekers to succeed are evolving faster than ever.

As AI technologies reshape the world of employment, skills-based hiring and global skilling initiatives are redefining how early career talent is being cultivated and recruited. In the midst of this transformation, higher education has a tremendous opportunity to help students and early job seekers find meaningful careers through the discovery and mastering of the latest essential skills.

Research in recent years has demonstrated that mastering skills like creative thinking, creative problem solving, communication and collaboration is necessary to thrive in a modern workplace. Extraordinary advancements in generative AI workplaces are also quickly adapting to unlock new efficiencies and creative potential.

To add insight into this quickly evolving landscape, the *2024 Creative AI Jobs Report* summarizes and adds to the latest industry reports, surveys, government policy, and academic research with some original research findings. This report offers a comprehensive overview of generative AI's current landscape and future directions for hiring and developing new talent, particularly recent graduates, and enhancing essential creativity and AI literacy skills across various industries. It also highlights top opportunities for higher education institutions and alternative education partners to best set students and learners up for career success with the most important, in-demand creative and AI skills.

The aim of this report is to inform and inspire higher education decision-makers to prepare students for the changing world of work through an understanding of how generative AI is reshaping the skills landscape, to provide an overview of government policy guidance regarding these technologies, and to offer strategic insight into how higher education institutions can address AI opportunities on their campuses.

Key questions

To meet the challenge of empowering students with the right skills to succeed, higher education decision makers, policymakers, and industry partners in the 2024-2025 academic year are asking:

1

What are the essential AI literacy, creativity, and productivity skills necessary for students today?

2

How can higher education institutions equip students to demonstrate these skills through their curricula and other campus programs?

3

How can campuses and industry partners match these newly skilled students with meaningful employment opportunities for job-seekers and entrepreneurs?

Key takeaways

Generative AI is already transforming the nature of work, a trend that will only grow as these tools evolve and proliferate. Forecasts predict 97 million jobs globally will be created as a result of generative AI in 2025, enhancing the way professionals work across sectors. By 2045, use of generative AI is expected to free up to 50% of current job tasks and thereby creating more space and demand for essential creative skills.

Workers and employers both see the critical need for generative AI skills, but training is not widely available. Two-thirds of workers expect their employer to provide opportunities to learn about generative AI, but a similar proportion report that their employer does not offer any generative AI training. As the workforce builds this training capacity, they are keen to hire recent graduates who already have basic generative AI literacy.

Generative AI literacy must be complemented with creative problem-solving skills to help career seekers land the right jobs. Nearly two-thirds of U.S. human resourcing managers believe cognitive skills – problem solving, creativity, ability to learn – and interpersonal skills will be critical as AI and automation spreads throughout the workplace.

Higher education institutions have a unique opportunity to fuse creative problem-solving skills and generative AI literacy for the future. Adobe's own research reveals the need for higher education institutions to continue preparing career seekers in essential skills like creative problem-solving and communication, with a focus on applying them in an AI-assisted workplace.

Educational institutions can partner with reputable organizations and companies to integrate these skills into their curricula and maximize the development of essential skills. Industry partnerships make it possible to certify career seekers and students with micro-credentials, adding credibility to skill development beyond the traditional degree. 81% of global hiring managers say seeing credentials makes it easier assess whether candidates have the necessary creative problem-solving skills.

The Rise and Impact of Generative AI

The impact of generative AI on work is already enormous. The International Monetary Fund estimates that in 2024 up to 40% of current global employment activity is already being impacted by AI.[1] That number rises to 60% in highly developed economies due to the prevalence of more white-collar, service-oriented jobs in those regions. A 2023 report from the World Economic Forum (WEF) also estimates that 97 million jobs may be created in the shifting of labor between humans and automation by 2025 due to AI (while another 85 million may be displaced). McKinsey similarly forecasts that activities that account for nearly one-third of work across the U.S. economy could be automated by 2030[2] while the WEF study reckons that about one-fifth of the workforce could have more than half their tasks automated by AI by 2045.[3]

97 M

jobs may be created globally by 2025 as a result of generative AI[4]

75%

of knowledge workers (i.e. desk jobs) use AI at work today, and 46% of users started using in the first half of 2024[5]

40%

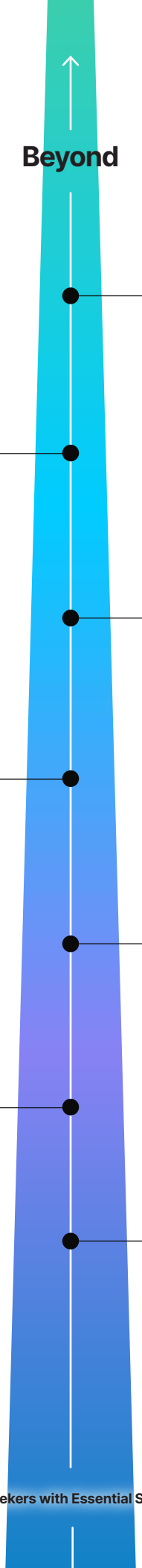
of global employment activity is exposed to AI influence in 2024[6]

30%

of hours now worked in the U.S. could be automated by 2030[7]

1 "Gen-AI: Artificial Intelligence and the Future of Work." International Monetary Fund, 2024.
2 "Generative AI and the Future of Work in America." McKinsey, 2023.
3 "The Future of Jobs Report." World Economic Forum, 2023.
4 "Jobs Consortium – Towards a New Vision for the Future of Work." World Economic Forum, 2023.
5 "AI at Work Is Here. Now Comes the Hard Part." Microsoft 2024 Work Trend Index Annual Report, 2024.
6 "Gen-AI: Artificial Intelligence and the Future of Work." International Monetary Fund, 2024.
7 "Generative AI and the Future of Work in America." McKinsey, 2023.

The next 10 years and beyond of generative AI and the future of work



By 2045

19% of the workforce could have over 50% of their tasks augmented by AI. – **World Economic Forum, 2023**

By 2030

Activities that account for up to 30% of hours currently worked across the US economy could be augmented—a trend accelerated by generative AI. However, we see generative AI enhancing the way STEM, creative, and business and legal professionals work rather than eliminating a significant number of jobs outright. – **McKinsey, 2023**

By 2028

30% of generative AI implementations will be optimized using energy-conserving computational methods, driven by sustainability initiatives. – **Gartner, 2024**

By 2027

More than 50% of the generative AI models that enterprises use will be specific to either an industry or business function. – **Gartner, 2024**

Six in ten workers will require retaining [before 2027], but only half of workers are seen to have access to adequate training opportunities today. **– World Economic Forum, 2023**

By 2026

75% of businesses will use generative AI to create synthetic customer data, up from less than 5% in 2023 – **Gartner, 2024**

2025

Generative AI is projected to bring $200 billion USD in value to global education. **– Morgan Stanley, 2023**

As early as 2024

40% of global employment activity is exposed to AI influence, skewed highly in favor of work in more highly developed economies (60%) vs. emerging economies (26%) due in large part to the prevalence of highly white collar, service-oriented jobs in those regions. **– International Monetary Fund, 2024**

Even by the speedy standards of the technology industry, generative AI is moving fast. When publicly available applications of generative AI like ChatGPT and DALL-E burst on the scene at the end of 2022, the popular focus was merely on text generation and surreal images. Today, similar tools from an ever-expanding array of companies can generate realistic video, mimic the emotion of the human voice, and even interpret and react to live events in real time.[8,9,10] As these tools improve, experts in analytics, economists, and futurists have all speculated about the myriad of ways media-generating AI will reshape the nature of work.

Industry leaders expect AI-driven automation and augmentation of jobs will create talent and skill shortfalls across sectors hungry for AI-literate workers. By 2030, Boston Consulting Group[11] estimates that a workforce shortfall driven by automation and demographic shifts will lead to significant talent deficits in technology, executive leadership, business operations, healthcare, and other professions historically tied to collegiate education. In a similar vein, the World Economic Forum predicts that the top five industries facing the highest exposure to change are financial services, insurance, IT services, telecommunications, and media.[12]

> ***"[W]e see generative AI enhancing the way STEM, creative, and business and legal professionals work rather than eliminating a significant number of jobs outright."***
>
> **– McKinsey, 2023**[13]

Despite the anticipated disruption, the broad consensus is that generative AI, like many previous technologies ranging from the printing press to the Internet, is more likely to empower employees by allowing them to set aside mundane, repetitive tasks and focus on higher-level work. Generative AI is also likely to create new kinds of work, just as the

8 Budwar et al. "Human resource management in the age of generative artificial intelligence: Perspectives and research directions on ChatGPT." Human Resource Management Journal, 2023.
9 Sun at al. "Would ChatGPT-facilitated programming mode impact college students' programming behaviors, performances, and perceptions? An empirical study." International Journal of Educational Technology in Higher Education, 2024.
10 Tilli et al. "What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education." Smart Learn. Environ, 2023.
11 "The Future of Jobs in the Era of AI." Boston Consulting Group, 2021.
12 "Jobs of Tomorrow: Large Language Models and Jobs." World Economic Forum, 2023.
13 "Generative AI and the Future of Work in America." McKinsey, 2023.

Internet created the need for roles like web design and digital content. Generative AI will also allow people to perform more hybrid roles that span several skills rather than being hyper-specialized in one area.

> ***"[I]ntegrating AI into our workplaces is a balancing act between seizing opportunities and managing potential disruptions."***
>
> **– World Economic Forum, 2023**[14]

Importantly, career seekers must be equipped with essential problem-solving and creative skills to use generative AI tools ethically and effectively.[15] Users must know not only how to structure prompts to get valid results, but also how to fact-check the AI-generated responses using systems like content credentials to see how they were created and assess the quality of different models to ensure they are designed responsibly to minimize bias, plagiarism, or harmful content. When it comes to media-generating generative AI, users also need to have an understanding of what creations are visually effective from a design and communication perspective. Relying on these tools means that users must understand the nuances of generative AI's strengths and limitations as workers increasingly move into hybrid roles, tackling multiple specializations or tasks simultaneously.[16]

The consensus among researchers anticipates that there is tremendous potential for individual career seekers who are equipped with foundational creative skills alongside competence in using AI tools. As the demand for digital skills and AI literacy rises, other essential skills like creative problem-solving, communication, and collaboration and teamwork will become increasingly crucial to succeed.

14 "Jobs of Tomorrow: Large Language Models and Jobs." World Economic Forum, 2023.
15 Anders, B., "Is using ChatGPT cheating, plagiarism, both, neither, or forward thinking?" Patterns, 2023.
16 "Jobs of Tomorrow: Large Language Models and Jobs." World Economic Forum, 2023.

How Workforce Training Programs are Meeting the Demand for AI Skills and the Skills Gap

Worldwide, companies are looking to use AI advances to their advantage. As a result, awareness of generative AI's impact is already high among job seekers and business leaders alike. Yet while the big-picture aspiration for an AI-ready workforce exists among leaders, the modern workforce is unprepared for the necessary job training programs that need to be rapidly developed. Recruiting teams are seeking new employees who stand out as resilient, life-long learners because they have sought out skilling or re-skilling in their degrees or through alternative education programs. Higher education institutions play an essential role in preparing workers for the new jobs ecosystem by helping bridge the skill development gap.

By 2027, six in 10 workers will require some sort of reskilling, but only half of workers have access to adequate training opportunities today, according to the World Economic Forum.[17] At the same time, an international look at hiring trends in the 2023 Work Trend Index Annual Report finds that 66% of business leaders will not hire a candidate without AI skills.[18] As referenced earlier, workers and employers not only recognize the need for generative AI training, but also the importance of creative problem-solving skills that complement generative AI and digital skills and cannot currently be easily replicated by technology.

97M jobs may be created globally by 2025 as a result of generative AI[19]

75% of knowledge workers (i.e. desk jobs) use AI at work today[20]

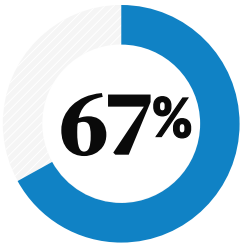
40% of global employment activity is exposed to AI influence in 2024[21]

Four in five business leaders expect generative AI to lower business costs while increasing revenue, according to a Salesforce survey.[22] But, underscoring the need for training, the same survey found that a large majority of workers do not feel confident using generative AI tools. Additionally, workers expect their employers to help them close the skills gap, but most employers are falling short of that expectation.

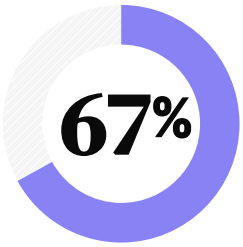
The World Economic Forum also found that training workers in AI and Big Data ranked third among company skills-training priorities in the next five years and will be prioritized by 42% of surveyed companies. However, there is a significant gap between the supply and demand of AI skills, as many workers lack access to adequate training opportunities, a trend that mirrors the larger skills landscape. It is taking time for companies to evaluate the right training for their employees. A 2023 survey by TalentLMS, maker of an online learning platform, found that 85% of U.S. human resource managers are planning some form of AI training for their employees.[23]

> ***"While 81% of companies consider investing in learning and on-the-job training to be a key strategy for delivering their business goals, only 34% consider providing reskilling and upskilling to be a way to increase talent availability specifically."***
>
> **– World Economic Forum, 2023**[24]

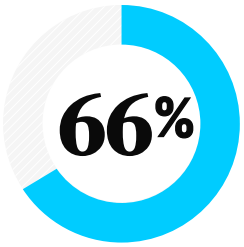
17 "Jobs of Tomorrow: Large Language Models and Jobs." World Economic Forum, 2023.
18 "AI at Work Is Here. Now Comes the Hard Part." Microsoft, 2024 Work Trend Index Annual Report, 2024.
19 "Jobs Consortium – Towards a New Vision for the Future of Work." World Economic Forum, 2023.
20 "AI at Work Is Here. Now Comes the Hard Part." Microsoft, 2024 Work Trend Index Annual Report, 2024.
21 "Gen-AI: Artificial Intelligence and the Future of Work." International Monetary Fund, 2024.
22 "Over Half of Workers Say Generative AI Will Help Advance Their Career, but Most Lack the Skills." Salesforce, 2023..
23 "Mapping Out Skills for Success in the AI-driven Future." TalentLMS, 2023.
24 "The Future of Jobs Report." World Economic Forum, 2023.



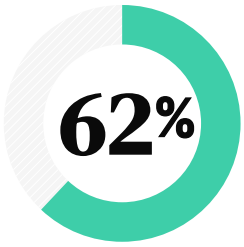
of job seekers say they are aware of AI and its potential impact on the workforce[25]



of workers expect their employer to provide opportunities to learn about generative AI[26]



of workers say their employer does not offer any generative AI training[27]



of workers say they don't have the skills to use generative AI effectively and safely[28]

The landscape of employment is rapidly prioritizing AI literacy. The Workforce 2024 report from LinkedIn and Microsoft reveals a striking trend: 66% of leaders now prioritize AI skills when hiring, to the extent that they would not consider a candidate without them.[29] Furthermore, 71% are inclined to hire less experienced individuals if they possess AI competencies over more seasoned applicants lacking in this area. This shift underscores the critical role of AI proficiency in the current job market.

Interestingly, it is the creative professionals, particularly content writers and graphic designers, who are seizing this opportunity more swiftly than others. Their quick adaptation to integrate AI into their skillset not only makes them more employable but also pioneers in this new era where technology and creativity intersect. The same study highlights how these creatives are at the forefront of this trend, leveraging AI to enhance their work and secure their positions in a competitive landscape.

The new hiring imperative: AI aptitude takes center stage

Survey question: "*To what extent do you agree or disagree with the following statements about generative artificial intelligence's (AI's) impact on skills?"*

In considering job candidates, I would not hire someone without AI skills

66%

Leaders would not hire someone without AI skills

I would be more likely to hire a less experienced candidate with AI skills than a more experienced candidate without AI skills

71% **Leaders are more likely to hire a less experienced candidate with AI skills than a more experienced one without them**

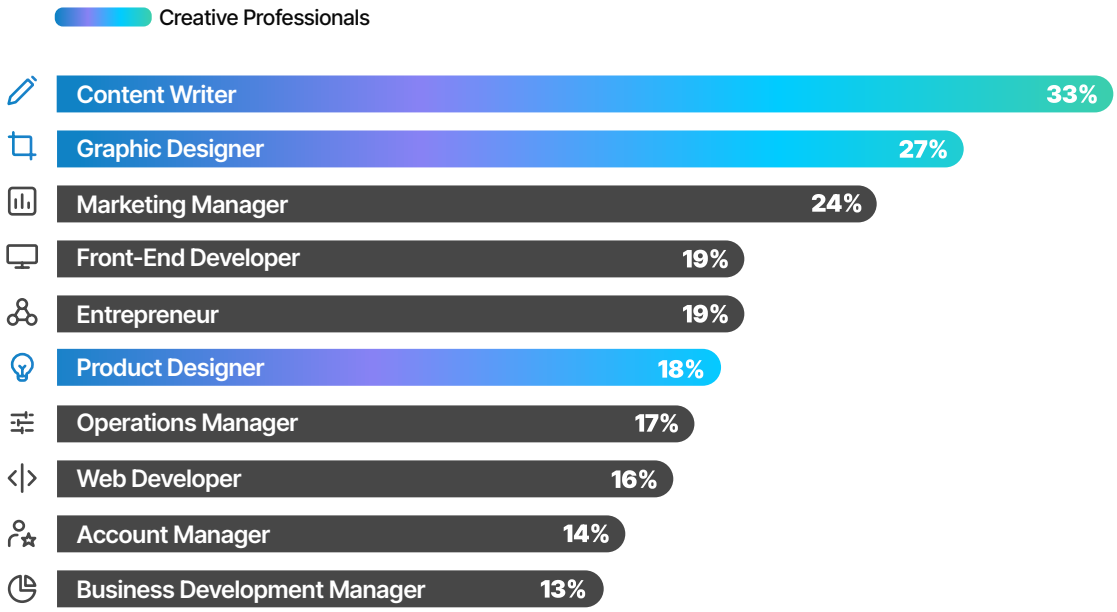
Because they can delegate more work to AI, early-in-career talent will be given greater responsibilities

77% **Leaders say early-in-career talent will get greater responsibilities**

2024 Work Trend Index Annual Report from Microsoft and LinkedIn

25 "AI Skills Will Be Crucial for Job Seekers." SHRM, March 26, 2024.
26 "Over Half of Workers Say Generative AI Will Help Advance Their Career, but Most Lack the Skills." Salesforce, July 12, 2023.
27 Ibid.
28 Ibid.
29 "AI at Work Is Here. Now Comes the Hard Part." Microsoft, 2024 Work Trend Index Annual Report, 2024.

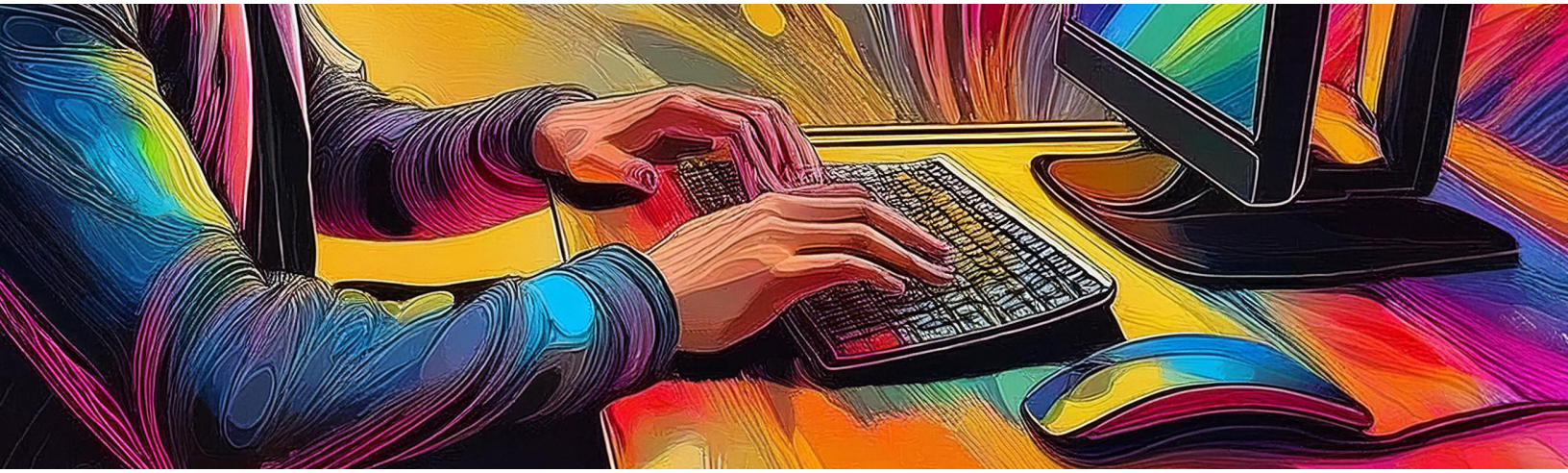
AI is going mainstream, and creative professionals are skilling up fast



2024 Work Trend Index Annual Report from Microsoft and LinkedIn

Occupations with the greatest percentage of members on LinkedIn adding AI aptitude skills to their profiles

Altogether, it is clear that even the most robust employee training programs are a temporary, low-scale solution. Most importantly, employers need to see more candidates entering their workforce who are already skilled up in the latest technology and advancements, including generative AI and creativity. It is more important than ever that K-12 and higher education institutions prepare students with experience in the right technology, tools, and – most importantly – essential skills like creative problem-solving and life-long learning.



The Impact of Generative AI on Skills Development and the Future of Work

A new set of essential skills are rising in importance as generative AI reshapes the workforce, including creativity, problem-solving, communication and collaboration. Traditionally dubbed "soft skills," research is showing these skills are now solidly "essential skills," even moreso in age of generative AI.

These essential skills involve a complex interplay of uniquely human traits such as true novelty, innovation, and self-expression. With the assistance of AI, creativity can more efficiently communicate the problem and the decision-making process for solving it in different formats for varying audiences, and using creative or multimedia tools to present and communicate the best ideas and solutions.

Of course, initial reports of new skills needed in the age of AI focused on the growing need for AI technical skills like coding and the creation, training, and refining of AI models and tools. However, it is now clear the far greater opportunity for careers and skills centers on the need for every employee or small business owner to be able to fluently use an array of generative AI tools to assist with everyday tasks. These tasks cut across jobs and industries and range from brainstorming ideas, analyzing and synthesizing information, designing visual content, drafting or editing written content, automating spreadsheets, contracts, financial work, and more.

Top 10 skills on the rise between 2023 – 2027[30]

1. **Analytical thinking**
2. **Creative thinking**
3. Resilience, flexibility and agility
4. Motivation and self-awareness
5. Curiosity and life-long learning
6. Technological literacy
7. Dependability and attention to detail
8. Empathy and active listening
9. Leadership and social influence
10. Quality control

> *"The responsible development and use of AI require a commitment to supporting American workers. As AI creates new jobs and industries, all workers need a seat at the table, including through collective bargaining, to ensure that they benefit from these opportunities. My Administration will seek to adapt job training and education to support a diverse workforce and help provide access to opportunities that AI creates."*
>
> **– President Joe Biden, Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence**[31]

> *"[T]he ability to develop crisp mental models around the problems you want to solve and understanding the why before you start working on the how is an increasingly critical skill, especially in the age of AI."*
>
> **- Marco Argenti, CIO Goldman Sachs**[32]

> *"I believe leaders will need to sharpen and improve their soft skills, such as emotional intelligence, creativity, critical thinking, and communication. Leaders with these skills will be better equipped to work effectively with AI and lead their teams to success. Another new, or underutilized, skill we'll need to refine discernment to avoid unquestioningly trusting AI and to make informed decisions based on a lifetime of experience and emotional connections to others."*
>
> **- Ebrahim Hyder, Vice President of Customer Service at Michael Kors**[33]

30 "The Future of Jobs Report." World Economic Forum, 2023.
31 "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence." The White House, Oct 2023.
32 "Why Engineers Should Study Philosophy." Harvard Business Review, 2024.
33 "How Work and Leadership Will Change as AI Advances," Execs In the Know, Oct 2023

What the **experts are saying** about **essential AI skills**

"[C]ognitive skills are reported to be growing in importance most quickly, reflecting the increasing importance of complex problem-solving in the workplace. Surveyed businesses report creative thinking to be growing in importance slightly more rapidly than analytical thinking."

- World Economic Forum, 2023[34]

"+57% increase in the importance of problem-solving skills among learning and development professionals between 2022's release of consumer-facing generative AI tools and late 2023."

- LinkedIn Workplace Learning Report, 2024[35]

"65% of human resourcing managers in the U.S. agreed that cognitive skills – problem-solving, creativity, ability to learn – and interpersonal skills – active listening, managing people, creating synergies – will be critical as AI and automation spreads throughout the workplace."

- Talent LMS, 2023[36]

"Visual design skills mean that the creator can put written language and pictures together in a way that is clear and focused for the audience."

- Adobe & Edelman Research, 2024[37]

"Meanwhile, core human abilities—such as empathy, imagination, creativity, and emotional intelligence, which cannot be replicated by technology—will become more valuable. The supply of talent for occupations that require these abilities—such as health care workers, teachers, and counselors—is currently limited, causing the high shortfalls we see in these job families."

- Boston Consulting Group, 2021[38]

"Evidence from online job openings in several countries shows that, in addition to a set of generic skills, AI-related workers need communication, problem-solving, creativity, and teamwork-related skills."

- Ramos, 2022; Squicciarini & Nachtigall, 2021[39]

"The ability to communicate transparently and candidly about sensitive issues, thus, becomes an even more important learning objective for business communication courses. Other competencies such as inspiring others, strategic vision, motivation and drive, and innovation and creativity follow closely in terms of perceived growing importance."

- Cardon et al. 2023[40]

34 "The Future of Jobs Report." World Economic Forum, 2023.
35 "AI at Work Is Here. Now Comes the Hard Part." Microsoft, 2024 Work Trend Index Annual Report, 2024.
36 "Mapping Out Skills for Success in the AI-driven Future." TalentLMS, 2023.
37 "The Creative Edge: How Digital Credentials Unlock Emerging Skills in the Age of AI," Edelman DXI and Adobe, 2024
38 "The Future of Jobs in the Era of AI." Boston Consulting Group, 2021.
39 Ramos, G., "A.I.'s Impact on Jobs, Skills, and the Future of Work: The UNESCO Perspective on Key Policy Issues and the Ethical Debate." New England Journal of Public Policy: Vol. 34: Iss. 1, Article 3, 2022 AND Squicciarini, M. and H. Nachtigall (2021), "Demand for AI skills in jobs: Evidence from online job postings", OECD Science, Technology and Industry Working Papers, No. 2021/03, OECD Publishing, Paris.
40 Cardon, P., Fleischmann, C., Logemann, M., Heidewald, J., Aritz, J., & Swartz, S. (2023). Competencies Needed by Business Professionals in the AI Age: Character and Communication Lead the Way. Business and Professional Communication Quarterly, 87(2), 223-246. https://doi.org/10.1177/23294906231208166

Essential skills in the age of AI

% of Hiring Managers[41] and Educators[42] who agree these creative problem-solving skills are becoming more important in the age of AI

	Hiring Managers	Educators
Creativity or creative problem-solving	67%	73%
Communication	66%	79%
Critical thinking	65%	73%
Collaboration	60%	65%

New Insights

To fill gaps in the correlation between creativity and AI in this new world of hiring, Adobe and Edelman researched the latest attitudes toward these skills among global hiring managers and college educators in the U.S. The vast majority of both of audiences say these skills, especially creativity, are becoming more essential with the rise of generative AI tools.

Creativity or creative problem-solving, as well as new communication across media, are the two important skills with the advent of AI, according to hiring managers and higher education educators. In part, these skills are seen as the most uniquely human, and so are viewed as augmentable, but not replaceable, by generative AI. Additionally, as productivity gains from artificial intelligence enable expanded roles with more responsibility, there is an exciting opportunity for more roles, jobs, and divisions to give more attention to the value gained from highly skilled creative thinking and communication.

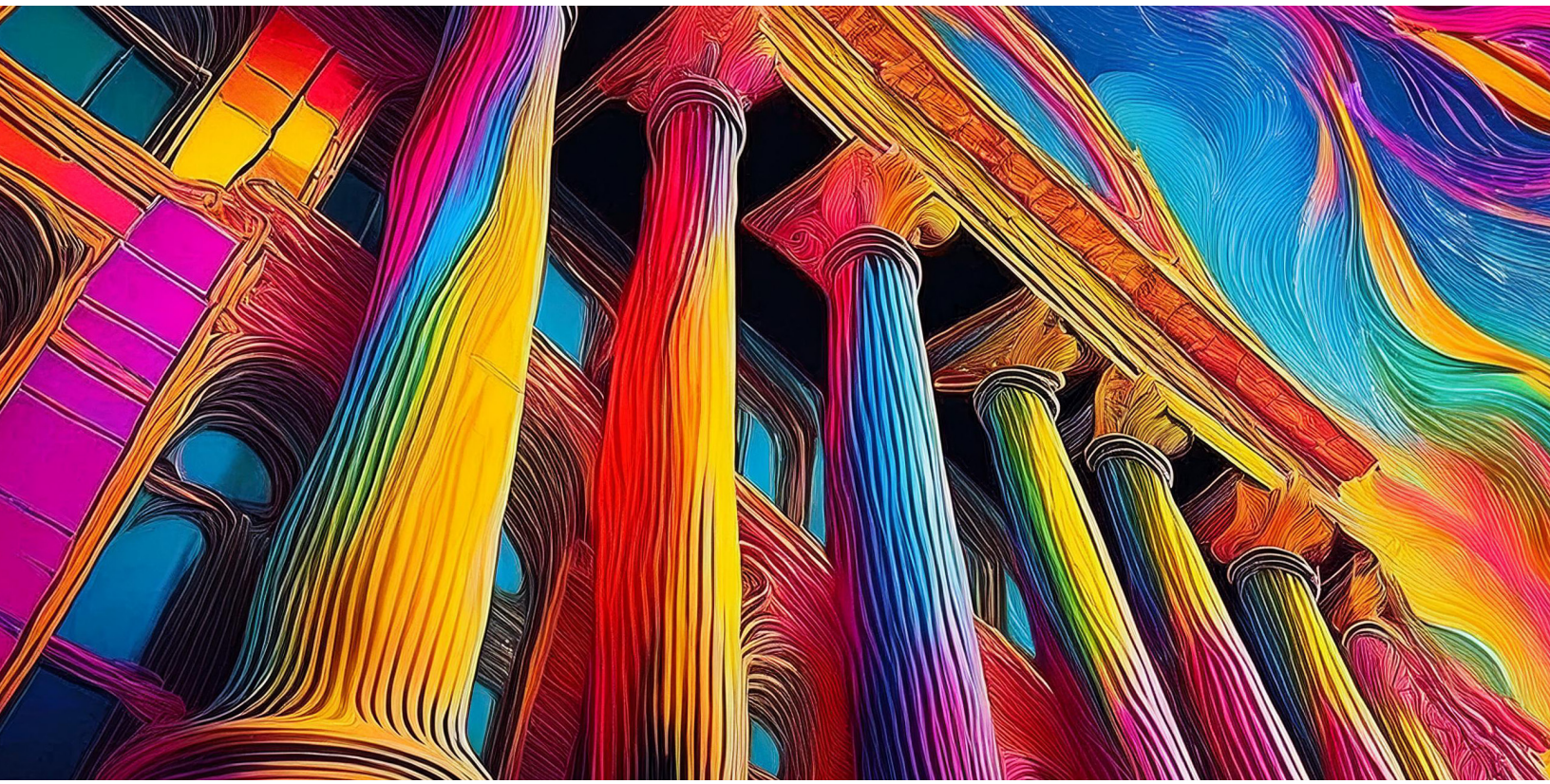
In response to these trends, governments and policy leaders across the globe are working fast to establish guidelines to aid the education sector in taking full advantage of this opportunity to skill up students and career seekers.

41 Edelman & Adobe Original Research (Global Hiring Managers, N=680), 2024
42 Edelman & Adobe Original Research (U.S. Higher Education Faculty/Instructors, N=200), 2024

How Government Policy is Responding to Generative AI and Education

Like most institutions, higher education has been rattled by the impact of generative AI's explosive growth. In 2023 a UNESCO survey[43] found that less than 10% of schools and universities globally had developed institutional guidelines or policies on the use of generative AI, clearly highlighting the need for assistance in overcoming the uncertainties AI proliferation has caused. A year later, a 2024 EDUCAUSE report found that only 23% of respondents indicated that their institution had any AI-related acceptable use policies in place; nearly half (48%) of respondents disagreed or strongly disagreed that their institution had "appropriate policies and guidelines in place to enable ethical and effective decision-making about AI use."[44]

At the same time, governments at all levels are highly motivated to ensure K-12 and higher education institutions stay ahead of the curve on AI skilling, as upskilling programs for current workers cannot bear the full weight of ensuring workforce economies stay competitive. With the growing demand for an AI ready workforce, governments have readily developed AI policy guidance as a starting point for overseeing the ethical and safe use of AI. These guidelines seek to aid higher education not only in encouraging responsible use of technology, but also leveraging these frameworks to receive needed support, grants, funding for research, faculty development, and student training resources.



43 "UNESCO Survey: Less than 10% of schools and universities have formal guidance on AI," UNESCO, 2023.
44 "2024 EDUCAUSE AI Landscape Study," EDUCAUSE, 2024.

As of late 2024, 23 U.S. states had released K-12 guidance on the use of generative AI in education. Eighteen of these states mention the importance of fostering creativity with the use of generative AI in the classroom. Other major themes among the state guidance included (1) evolving workforce needs, (2) human-centered, responsible use of AI technologies, (3) AI literacy and professional development, (4) equity and inclusion, (5) data privacy, security, and safety, (6) pedagogical considerations, and (7) computer science education.[45]

At the Federal level, AI policy guidance in the United States has seen significant advancement, especially with the Biden-Harris Administration's "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence" in late 2023.[50] The Executive Order establishes policies and principles that all U.S. departments, agencies, and organizations should adhere to when using AI, with a focus on safety and security risks, including privacy protections, advancement of equity and civil rights, promoting innovation and competition, and more.

This order also advances investments in AI-related education, training, development and research. Specifically, to adapt job training and education to help provide access to opportunities that AI creates through the National Science Foundation (NSF) and other outlets.[51]

Generative AI education policy guidance examples

U.S. State-level policy

California:

- The California Department of Education (CDE) has developed resources to support the implementation of AI in schools, including an AI resource kit.[46] The kit supports school systems to navigate the safe, effective, and responsible use of AI by developing guidance.
- California has also implemented a resource from the TeachAI initiative, which helps education authorities, school leaders, and teachers create thoughtful guidance to realize the potential benefits of AI in education while understanding and mitigating potential risks.
- "Infusing AI skills and computer science standards into K-12 education aligns curriculum with the needs of the modern world, fosters critical thinking and creativity, and prepares students to become active contributors to the AI revolution."

North Carolina:

- North Carolina's Department of Public Instruction (NCDPI) has released comprehensive guidance on the use of artificial intelligence in schools. NCDPI generative AI Implementation Recommendations and Considerations for PK-13 Public Schools encourages the use of AI, while detailing how schools can integrate AI into coursework responsibly.[47]
- NCDPI's Office of Digital Teaching and Learning, in collaboration with the organization AI for Education, created the "EVERY framework" for ethically implementing AI. It stands for Evaluate, Verify, Edit, and Revise, providing guidance for using AI responsibly every time.
- "Provide students the ability to explore their creativity in new ways by using natural language input to create new works of art for self expression, illustrate their own writing, or demonstrate learning."

International policy

Japan:

- Japan issued Temporary Guidelines for Use of generative AI in Primary and Secondary Education in 2023. The document contains guidance for schools and teachers on the general approach to take to incorporate generative AI in education and points to possible topics to be aware of when using it, such as protecting personal information, privacy, and copyright.
- Japan's guidance encourages the cautious use of generative AI while reasserting the importance of fact-checking and the development of information literacy. Japan also aims to promote the use of generative AI among teachers to reduce their administrative workload and to enhance their digital/AI literacy. Under the Guidance, teachers must advise students to refrain from using generative AI for graded tasks.[48]

England:

- England's Policy paper on generative AI in Education 2023: In 2023, the English Department of Education's (DfE) released a policy paper that sets out the position of the government on the use of generative AI in education. It outlines both the limitations and benefits of using generative AI in education settings.[49]
- The policy prohibits intellectual property from being used for training generative AI models without proper consent. The policy also emphasized cybersecurity, encouraging institutions to strengthen measures based on established standards.

45 "Review of Guidance from Seven States on AI in Education." Digital Promise, 2024.
46 "Artificial Intelligence Learning with AI Learning about AI." California Department of Education, 2024.
47 "North Carolina Generative AI Implementation Recommendations and Considerations for PK-13 Public Schools." North Carolina Department of Public Instruction, 2024.
48 "Emerging governance of generative AI in education," 2023, OECD iLibrary
49 "Generative artificial intelligence (AI) in education," U.K. Department for Education, 2023
50 "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence." The White House, Oct 2023.
51 "Advancing education for the future AI workforce." EducateAI, 2023.

As part of the Executive Order, the U.S. government has also launched a National AI Talent Surge to accelerate hiring AI professionals across the federal government.

Another notable policy in motion includes the Artificial Intelligence Literacy Act, which aims to help colleges and universities teach students to use the rapidly advancing technology safely and ethically. The act recognizes AI as a crucial part of digital literacy and seeks to make AI literacy available through public schools, universities, and libraries. It offers grants that will help school administrators develop virtual learning platforms for remote and individualized AI instruction and build labs to provide students with hands-on AI learning experiences.[52]

In June 2024, the U.S. Department of Education's Office of Educational Technology also released their latest AI in schools guidance: Designing for Education with Artificial Intelligence: An Essential Guide for Developers. These policies represent a significant step in establishing a framework for the ethical and secure advancement of AI technologies, along with investments and commitments to AI resources within education. Higher education institutions are now beginning to leverage these existing guidance examples from state and international governments, including K-12 frameworks, to ensure continuity in learning outcomes and guidelines between primary, secondary, and higher education learning pathways.

> *"We envision a technology-enhanced future more like an electric bike and less like robot vacuums. On an electric bike, the human is fully aware and fully in control, but their burden is less, and their effort is multiplied by a complementary technological enhancement."*
>
> **– Department of Education Office of Educational Technology, "Artificial Intelligence and the Future of Teaching and Learning," May 2023**[53]

> *"The AI Literacy Act is an important example of Congress adapting to labor market shifts. As AI becomes more prevalent, it's essential that workers have the opportunity to upskill and reskill to meet the economic moment and business need. Digital skills, including working with AI, remain absolutely essential for job seekers, which is why funding for workers to access digital skills is crucial for workers and businesses."*
>
> **– National Skills Coalition, 2023**[54]

52 "New proposal offers federal funding for AI literacy in higher ed." University Business, January 14, 2023.
53 "Artificial Intelligence and the Future of Teaching and Learning." Office of Educational Technology, May 2023.
54 "Bill Would Fund AI Education Across the Country." buschon.house.gov, January 2, 2024.

The Essential Role of Higher Education in Preparing Students for AI-ready Careers

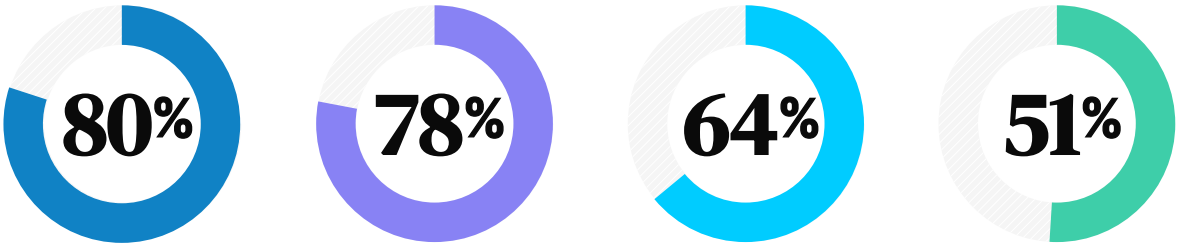
When it comes to adopting generative AI, higher education is balancing two interlocking priorities. On the one hand, they must address concerns over academic integrity, harmful or biased content, and data privacy to ensure student projects and faculty intellectual property is not compromised when using AI tools. This effort includes not just choosing the right tools and models that support those goals, but also ensuring faculty, staff, and students have the right curricula and training on AI literacy.

On the other hand, there is growing acknowledgment of the potential of generative AI to personalize learning, assist in brainstorming, summarize material, address staffing shortages, and enhance equity and accessibility in education.[55] Despite initial concerns about AI-generated work,[56] colleges and universities still stand as the institutions best positioned to steer the productive use of generative AI and to ensure it drives positive student outcomes, both for academics and careers.

Most higher education decision makers are already strategically implementing generative AI at their campuses to varying degrees. Our own survey conducted for this report reveals that educators strongly recognize the benefits of teaching AI literacy, safety, and ethics as well as the use of these tools to enhance creative problem-solving and communication. 80% of teaching faculty and instructors agree it is important to teach students to use generative AI responsibly, while 78% agree student "critical thinking" and "communication" are enabled, not replaced, by use of AI tools.[57]

> ***"With the ability of AI now to create images and other things, how do we know what's authentic and what's not? That's going to be one of the things we have to teach our students is how to add that critical thinking, that analysis to a new set of factors that may be AI generated."***
>
> **– Higher education faculty member, Adobe & Edelman DXI, 2024**[58]

Views of U.S. Educators towards teaching generative AI[59]



80% say it is important to teach students how to use generative AI responsibly

78% believe generative AI tools enable core skills like critical thinking and communication

64% say their school's use of generative AI has increased over the past year

51% recommend students familiarize themselves with generative AI

55 Yusef et al., "Generative AI and the future of higher education: A threat to academic integrity or reformation? Evidence from multicultural perspectives." International Journal of Educational Technology in Higher Education, March 25, 2024.
56 Anders, B., "Is using ChatGPT cheating, plagiarism, both, neither, or forward thinking?" Patterns, 2023.
57 Edelman & Adobe Original Research (U.S. Higher Education Faculty/Instructors, N=200), 2024
58 Ibid.
59 Ibid.

Examples of higher education approaches to AI training

	AI Task forces/ councils/teams	Certifications for working professionals	Encouraging proposals/research	Industry Partnership
Current initiatives	Many universities, including Boston University, University of Kentucky, and University of Maryland, have put together committees and councils to address generative AI usage on their campuses. They study and analyze generative AI tools, their uses, and create recommendations and guidelines for various stakeholders on campus (admin/faculty/ students) around how generative AI should be used in the educational setting.	Various universities, such as Northwestern, Purdue, and Cornell, offer courses and certificate programs about harnessing generative AI for business purposes. These programs are intended for working professionals and executives rather than existing undergraduate and graduate students.	A handful of universities, including Stanford and Vanderbilt, offer grants to students/faculty to do research on generative AI. In a similar vein, Arizona State University has a partnership with OpenAI, and part of this collaboration includes a call for submissions of innovative uses of ChatGPT Enterprise.	While the ASU-OpenAI partnership focuses on generative AI, most other university partnerships primarily involve technical AI development rather than creative problem-solving skills. For example, Intel has partnered with 18 community colleges to create AI associate degree programs. Several tech companies including Amazon, Microsoft, and NVIDIA, have invested in AI research partnerships between US and Japanese universities.
Next horizon	Future recommendations and guidelines will go beyond cautionary avoidance of misuse and abuse towards encouraging innovative AI usage among campus members.	While programs primarily aim at professionals already well into their careers, future initiatives will advance programs to prepare students with generative AI skills to ensure they do not lag behind workforce needs.	Universal pipelines for student and career seeker engagement with available AI opportunities facilitated through their schools, particularly among non-traditional, smaller schools serving diverse communities.	While industry partnerships that emphasize the technical development of AI tools abound, new demand focuses on training essential creative skills that enhance career readiness across all industries.

Higher education institutions have the opportunity to leverage their programs and curricula to prepare career seekers in those essential skills, with a focus on applying them in the AI-assisted workplace of the future. They can do this in several ways: integrating generative AI into their curricula, embracing micro-credentials as a way to confer competencies, and partnering with companies and organizations that are driving reskilling efforts around generative AI.

Integrating Generative AI Skills Across Curricula and Departments

As higher education institutions update their curricula to train faculty and students in how to use generative AI tools, it is essential that they focus on how these tools can bolster essential skills such as creative problem-solving that are critical to getting the most out of the technology and setting students up for academic and career success.

However, compared to their students, instructors and administrators lag in early adoption of generative AI, which is a significant hurdle to curricula adoption. A 2023 survey by Tyton Partners found that 48% of students reported at least having experimented with generative AI writing tools, with 36% being weekly or monthly users. By contrast, only 29% of instructors and administrators had even tried them once.[60]

This matters because instructors, administrators, and students who have experience with generative AI are significantly more likely to see its potential value in education and support institutional policies and practices that promote the responsible use of generative AI in teaching and learning.

Among administrators who had not tried generative AI, 52% agreed that it would have a negative effect on student learning. But among those who were already generative AI users, that fell to just 14%, according to the Tyton study, illustrating how, like any new technology, negative perceptions are often quickly dispelled through exposure.

Some of the most promising integrations of AI in the curriculum focus on augmentation through micro-credentials. Rather than replacing existing courses or modules, faculty are assigning short micro-credential courses, typically 1-5 hours each, on artificial intelligence tools that will help students complete their projects with more productivity and with more focus on creativity and communication.

60 "Generative AI in Higher Education: From Fear to Experimentation, Embracing AI's Potential." Tyton Partners, 2023.

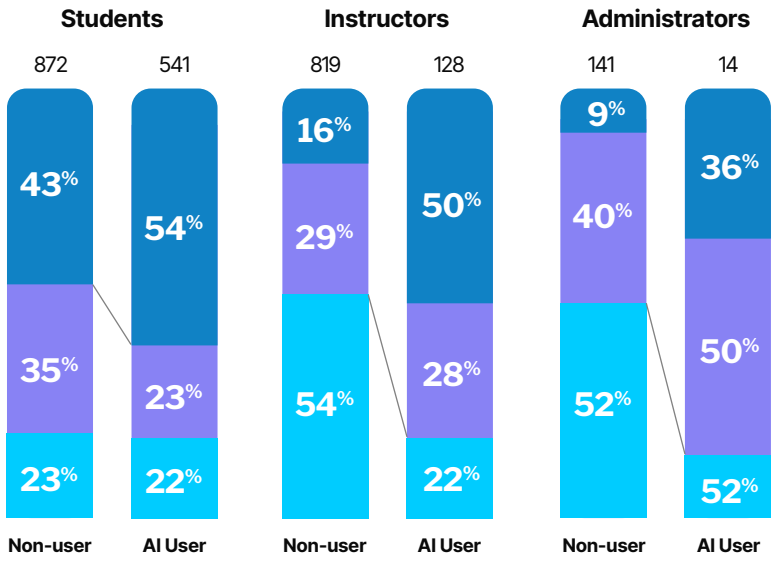
Gaps in perceptions and usage
Students, instructors, and administrators

Higher education familiarity with generative AI writing tools

Beliefs about generative AI writing tools' impact on student learning:

Survey Question: *"Of the following statements, indicate whether you agree, disagree, or are neutral."*

- *"I believe that AI generative writing tools will have a **POSITIVE** effect on student **learning**"*
- **NEUTRAL**
- *"I believe that AI generative writing tools will have a **NEGATIVE** effect on student **learning**"*

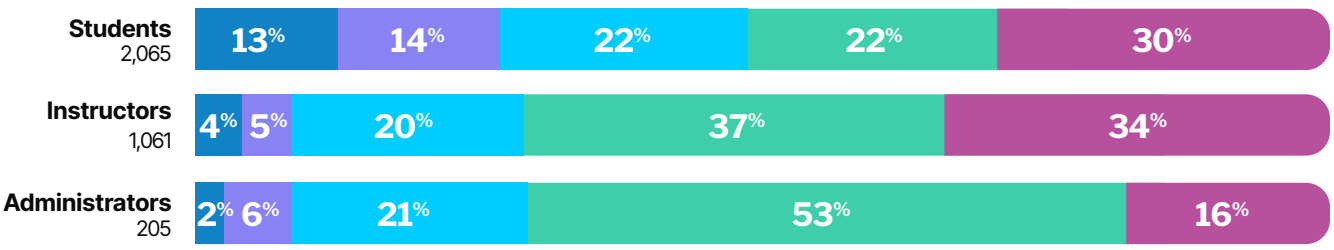


Source: "Generative AI in Higher Education: From Fear to Experimentation, Embracing AI's Potential." Tyton Partners, 2023

Familiarity with generative AI writing tools:

Survey Question: *"Which of the following best describes your own use of generative AI writing tools (e.g., ChatGPT)?"*

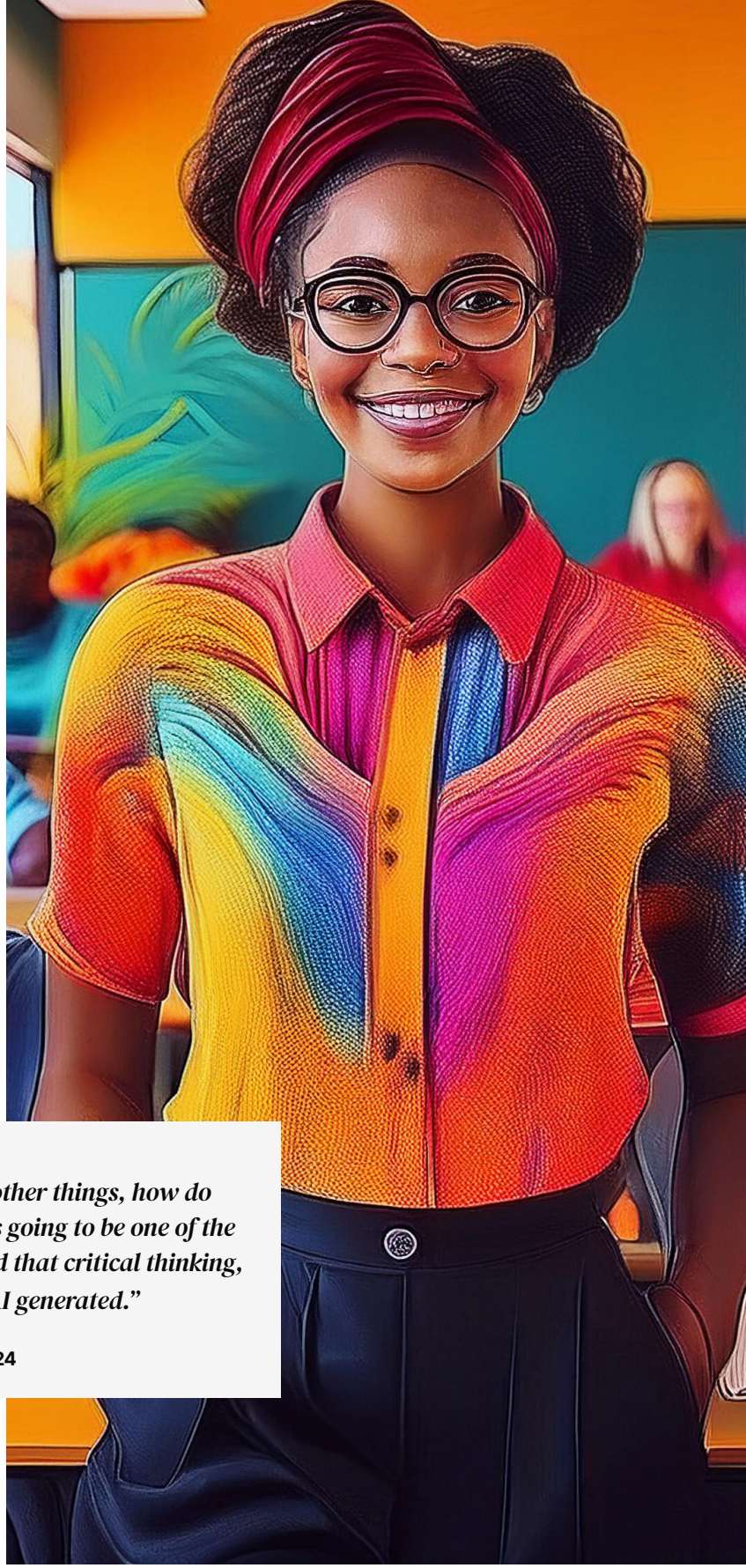
- **Frequent user**
- **Occasional user**
- **Experimented with generative AI writing tools**
- **Familiar with generative AI writing tools but have never used**
- **Not familiar with generative AI writing tools**



Source: "Generative AI in Higher Education: From Fear to Experimentation, Embracing AI's Potential." Tyton Partners, 2023

In recent research, instructors who were early adopters quickly found creative ways to incorporate generative AI into their courses, with a focus on brainstorming, editing, and outlining. Tyton Partners' research cited an example of a political science instructor who had students interview local politicians, then use ChatGPT to summarize their views and assess their electability. Students had to conduct a thoughtful interview that yielded usable information, then interpret complex political subtext, both of which require complex creative and critical thinking.

Amidst concerns that the use of generative AI in higher education needs to be fair and inclusive from a multicultural standpoint, new research shows a strong correlation between cultural dimensions and respondents' views on the benefits and concerns related to generative AI.[61] The survey of students and lecturers across 76 countries showed clear links between cultural differences and how people view generative AI with regards to ethics, effects, policies, and more. The recommendation for higher education administrators is to resist a one-size-fits-all approach and take cultural differences into account to create fair and effective rules for generative AI that can ensure equitable and diverse adoption across campus.



> ***"With the ability of AI now to create images and other things, how do we know what's authentic and what's not? That's going to be one of the things we have to teach our students is how to add that critical thinking, that analysis to a new set of factors that may be AI generated."***
>
> **– Higher education faculty member, Adobe & Edelman DXI, 2024**

61 Yusef et al. "Generative AI and the future of higher education: a threat to academic integrity or reformation? Evidence from multicultural perspectives." International Journal of Educational Technology in Higher Education, 2024.

Embracing Micro-credentialing to Highlight Specific Skills

Beyond incorporating generative AI tools into coursework and traditional degree tracks, colleges and universities can also explore offering micro-credentials, digital badges and other non-traditional certifications to help students build a suite of attractive AI literacy and essential skills in a way that can be easily communicated to prospective employers.

Our previous research leading to this report finds that hiring managers want to make sure that credentials have been issued by qualified organizations, are aligned with industry standards, and address real-world talent needs.[62] It turns out that colleges and universities are seen as the most credible institutions to offer these credentials, often in partnership with industry or external professional bodies who create the content or assessments.

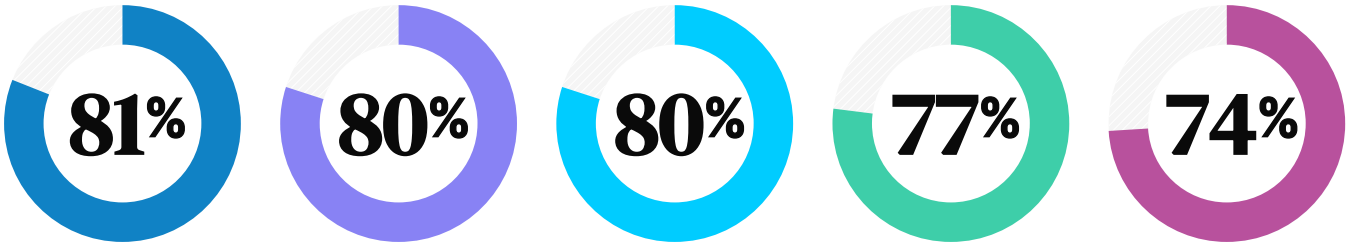
The recent growth in non-traditional and online education also offers higher education institutions expanded opportunities to teach these skills to a broader range of students across disciplines, as well as continuing education students or programs that engage alumni, local communities, and other non-traditional or alternative education learners that higher education institutions have the opportunity to serve.

% trust placed in credential-granting institutions by hiring managers[63]:

84%	Higher education institutions
83%	Professional bodies or industry associations
80%	Exam boards
68%	Online-only education companies

> *"Certifications [show me] they knew exactly what they wanted to do, maybe didn't have funding for school or were inspired by course work. We value hard work, dedication, and someone who is aspiring for something. That can come across in an interview especially well when they have multiple credentials."*
>
> **– U.S. Hiring Manager, 2023**[64]

Hiring Managers who agree with these statements about the value of credentials for creative problem-solving or visual design skills



- **81%** Easier to assess if candidates have the necessary skills
- **80%** Cost-effective way to help employees increase skills outside of what is provided by their organization
- **80%** Signal high-quality candidates
- **77%** My organization seeks candidates with these certifications
- **74%** Candidates with these skills deserve higher compensation

62 "The Creative Edge: How Digital Credentials Unlock Emerging Skills in the Age of AI." Edelman & Adobe, 2024.
63 Ibid.
64 Ibid.

Partnering with Companies and Organizations Invested in Skilling Students and Early Career-seekers in AI Literacy and Other Essential Skills

Crucially, higher education decision makers need guidance on how to best train career-seeking students in the appropriate industry skills needed to make full use of generative AI tools in a professional setting beyond academia. They need partners who can remove roadblocks, bring real-world expertise and best practices, and seamlessly integrate the right teaching tools, professional development, and curricular resources into their systems. These partners can include online learning platforms as well as the companies and organizations that are driving advancements in generative AI tools and services themselves.

There is a well-established blueprint for how universities and colleges can partner with companies to equip students with essential skills. For example, Adobe's Creative Campus program provides students with access to tools like Adobe Express, Acrobat, and Creative Cloud and encourages sharing of best practices with generative AI through provided curricula and student self-paced courses. Microsoft has worked with universities around the world to integrate technical skills in fields like computer science, data science, and cyber security. And Google has partnered with dozens of community colleges to offer professional certificates in IT support covering a range of digital skills.

When it comes to generative AI, community colleges are also at the forefront of establishing partnerships between higher education and industry. According to research conducted by the think tank New America, "thanks to substantial investments from federal agencies like the U.S. National Science Foundation and employers like Intel, Dell, and Amazon, at least one community college-level AI offering now exists in most U.S. states."[65]

Matching newly skilled students with employment opportunities in the age of AI requires a strategic approach that aligns education with industry needs. Schools can use technology to facilitate connections between students and employers, such as creating digital portfolios, providing personalized job recommendations, and deploying feedback surveys. In the table below are several identified strategies that colleges and universities can implement.

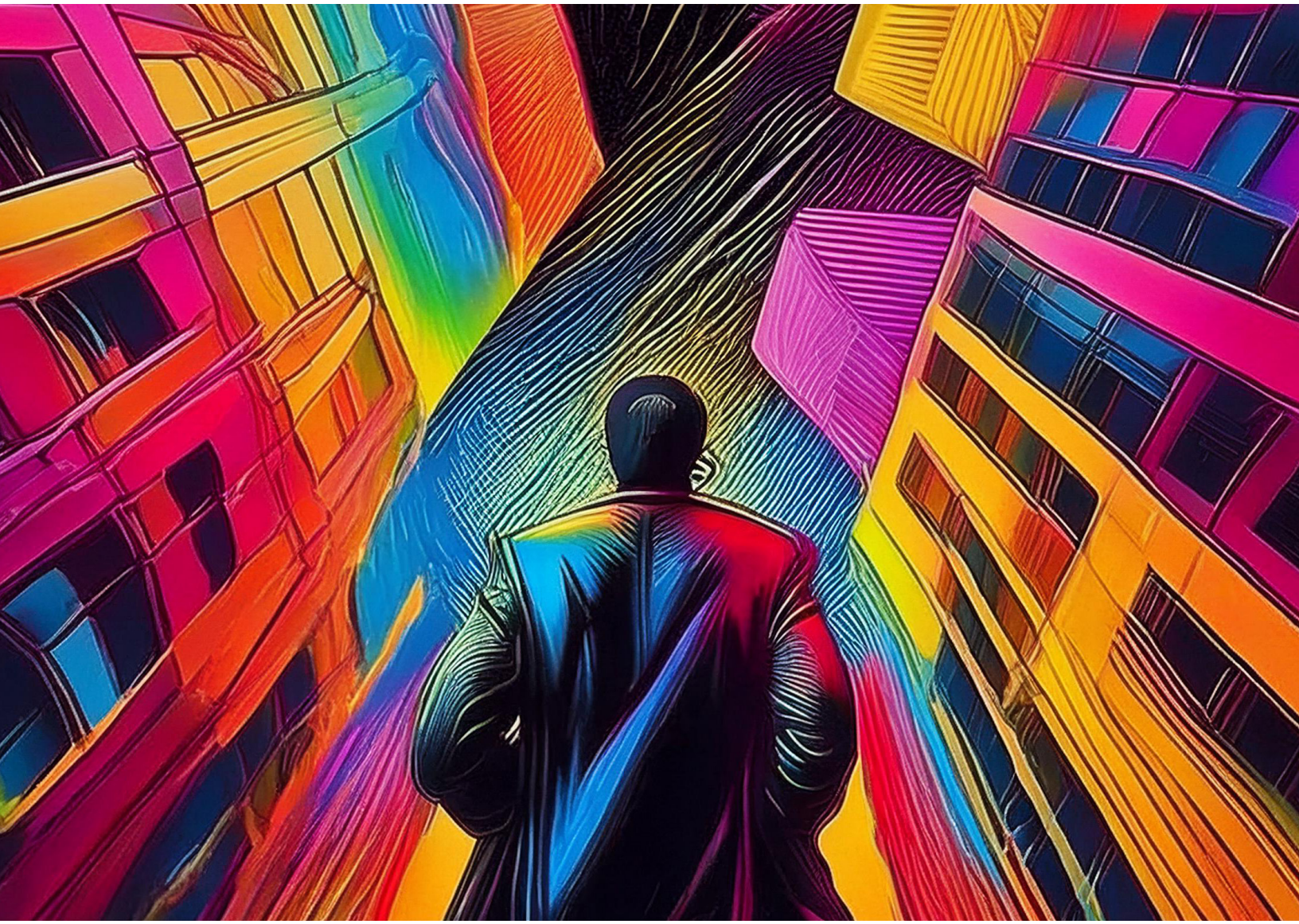
Actions decision makers can take to prepare students with essential skills in generative AI

Strengthen industry partnerships	Leverage AI and data analytics for job matching	Enhance career development programs
Internship Programs: Develop robust internship programs in collaboration with leading companies, providing students with hands-on experience in real-world settings. **Digital Credentialing Programs:** Adopt micro-credentialing offerings as part of degree plans to provide students hands-on experience in creative tools and skills.	**Personalized Job Recommendations:** Use AI-driven platforms to analyze students' skills, interests, and experiences to provide personalized job recommendations. **Skill Gap Analysis:** Implement tools that identify skill gaps and suggest relevant courses or training to bridge those gaps, making students more attractive to employers.	**Professional Mentorship:** Pair students with industry mentors who can provide guidance, advice, and networking opportunities. **Career Counseling:** Offer career counseling services that help students develop career plans, improve their resumes, and prepare for interviews.
Showcase student talent	**Promote entrepreneurial initiatives**	**Continuous feedback & Improvement**
Digital Portfolios: Encourage students to create digital portfolios showcasing their projects, skills, and achievements. **Capstone Projects:** Highlight capstone projects and research work through university platforms and events, attracting the attention of potential employers. **Student Showcases:** Organize events where students can present their work to industry professionals, providing visibility and networking opportunities.	**Incubation Programs:** Support student start-ups with incubation programs that provide resources, mentorship, and funding. **Pitch Competitions:** Organize pitch competitions where students can present their business ideas to potential investors and industry experts.	**Surveys and Feedback Forms:** Regularly gather feedback from employers about the performance of graduates to identify areas for improvement in the curriculum and training programs.

65 "4 Things to Know about How Students View Community College AI Education." New America, 2024.

Conclusion

The explosive growth of generative AI is revolutionizing virtually every industry, freeing up employees to focus on multi-faceted and creative tasks while creating new responsibilities and roles. As the demand for AI literacy rises, other essential skills like creative problem-solving, communication, and collaboration are becoming even more crucial. Higher education is adapting to the rise of generative AI, with a focus on responsible usage and the enhancement of essential skills. Colleges and universities have an opportunity to lead the way in conferring credibility to the digital and creative problem-solving skills that job seekers will need to succeed in the fast-changing world of work.



Bibliography

Edelman & Adobe Original Research:

1. Original data collected for this research includes surveys and in-depth interviews conducted among global hiring managers, and U.S. higher education instructors and decision makers.

   Audiences Surveyed:
   N=680 Global Hiring Managers (N=500 in U.S., N=50 in each of the U.K., India, Aus)
   N=200 U.S. Higher Education teachers (faculty/instructors)

   Audiences Interviewed:
   N=3 U.S. Higher Education Decision Makers (administrators with decision making authority over technology implementation)

2. "The Creative Edge: How Digital Credentials Unlock Emerging Skills in the Age of AI." Edelman Data and Intelligence and Adobe, 2024, https://cdn.edex.adobe.com/v3/uploads/resourceFile/2024/c4a329ec-b443-4009-a806-3812f4fc6bb7/5c879146-de0d-422b-898e-c9f1d5b69814.pdf

Global Extant Research:

3. "Advancing education for the future AI workforce (EducateAI)." U.S. National Science Foundation, 2023, https://new.nsf.gov/funding/opportunities/advancing-education-future-ai-workforce-educateai

4. "AI at Work Is Here. Now Comes the Hard Part." Microsoft 2024 Work Trend Index Annual Report, May 8, 2024, https://www.microsoft.com/en-us/worklab/work-trend-index/ai-at-work-is-here-now-comes-the-hard-part

5. "AI Skills Will Be Crucial for Job Seekers." Society for Human Resource Management, March 26, 2024, https://www.shrm.org/topics-tools/news/talent-acquisition/ai-skills-will-be-crucial-job-seekers

6. Anders, B.A., Is using ChatGPT cheating, plagiarism, both, neither, or forward thinking?, Patterns, Volume 4, Issue 3, 2023, 100694, ISSN 2666-3899, https://doi.org/10.1016/j.patter.2023.100694.

7. "Artificial Intelligence and the Future of Teaching and Learning." Office of Educational Technology, May 2023, https://tech.ed.gov/ai/

8. "Artificial Intelligence Learning with AI Learning about AI." California Department of Education, 2024, https://www.cde.ca.gov/ci/pl/documents/cdeairesourcekit.pdf

9. "Bill Would Fund AI Education Across the Country." buschon.house.gov, January 2, 2024, https://bucshon.house.gov/news/documentsingle.aspx?DocumentID=4527

10. Cardon, P., Fleischmann, C., Logemann, M., Heidewald, J., Aritz, J., & Swartz, S. (2023). Competencies Needed by Business Professionals in the AI Age: Character and Communication Lead the Way. Business and Professional Communication Quarterly, 87(2), 223-246. https://doi.org/10.1177/23294906231208166

11. "Emerging governance of generative AI in education," 2023, OECD iLibrary 10. Emerging governance of generative AI in education | OECD Digital Education Outlook 2023: Towards an Effective Digital Education Ecosystem | OECD iLibrary (oecd-ilibrary.org

12. "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence." The White House, 2023, https://www.whitehouse.gov/briefing-room/presidential-actions/2023/10/30/executive-order-on-the-safe-secure-and-trustworthy-development-and-use-of-artificial-intelligence/

13. "Generative AI in Higher Education: From Fear to Experimentation, Embracing AI's Potential." Tyton Partners, April 25, 2023, https://tytonpartners.com/generative-ai-in-higher-education-from-fear-to-experimentation-embracing-ais-potential/

14. "Generative artificial intelligence (AI) in education," U.K. Department for Education, 2023, Generative artificial intelligence (AI) in education - GOV.UK (www.gov.uk)

15. "Gen-AI: Artificial Intelligence and the Future of Work." International Monetary Fund, January 14, 2024, https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2024/01/14/Gen-AI-Artificial-Intelligence-and-the-Future-of-Work-542379?cid=bl-com-SDNEA2024001

16. "Generative AI and the future of work in America." McKinsey Global Institute, July 26, 2023, https://www.mckinsey.com/mgi/our-research/generative-ai-and-the-future-of-work-in-america

17. "Generative AI and the future of higher education: a threat to academic integrity or reformation? Evidence from multicultural perspectives." International Journal of Educational Technology in Higher Education, March 25, 2024, https://educationaltechnologyjournal.springeropen.com/articles/10.1186/s41239-024-00453-6

18. "Generative AI Is Set to Shake Up Education," Morgan Stanley, December 2023, https://www.morganstanley.com/ideas/generative-ai-education-outlook

19. "How Work and Leadership Will Change as AI Advances," Execs In the Know, Oct 2023, https://execsintheknow.com/magazines/october-2023-issue/how-work-and-leadership-will-change-as-ai-advances/

20. "Human resource management in the age of generative artificial intelligence: Perspectives and research directions on ChatGPT." Human Resource Management Journal, 2023, https://onlinelibrary.wiley.com/doi/10.1111/1748-8583.12524

21. "Jobs Consortium – Towards a New Vision for the Future of Work." World Economic Forum, 2023, https://www3.weforum.org/docs/WEF_Jobs_Consortium_Overview_2023.pdf

22. "Jobs of Tomorrow: Large Language Models and Jobs." World Economic Forum, 2023, https://www3.weforum.org/docs/WEF_Jobs_of_Tomorrow_Generative_AI_2023.pdf

23. "Mapping out skills for success in the AI-driven future." TalentLMS, 2023, https://www.talentlms.com/research/skills-for-ai-powered-future

24. "New proposal offers federal funding for AI literacy in higher ed." University Business, January 14, 2023, https://universitybusiness.com/new-proposal-offers-federal-funding-for-ai-literacy-in-higher-ed/

25. "North Carolina Generative AI Implementation Recommendations and Considerations for PK-13 Public Schools." North Carolina Department of Public Instruction, 2024, https://www.dpi.nc.gov/press-release/ncdpi-generative-ai-implementation-recommendations-and-considerations-pk-13-public-schools/download?attachment

26. "Over Half of Workers Say Generative AI Will Help Advance Their Career, but Most Lack the Skills." Salesforce, 2023, https://www.salesforce.com/news/stories/generative-ai-skills-research/

27. Ramos, G., "A.I.'s Impact on Jobs, Skills, and the Future of Work: The UNESCO Perspective on Key Policy Issues and the Ethical Debate." New England Journal of Public Policy: Vol. 34: Iss. 1, Article 3, 2022, https://scholarworks.umb.edu/nejpp/vol34/iss1/3/

28. "Review of Guidance from Seven States on AI in Education." Digital Promise, 2024, https://digitalpromise.dspacedirect.org/items/a3d38366-be66-4908-b40a-c9cda146ca2a

29. Squicciarini, M. and H. Nachtigall (2021), "Demand for AI skills in jobs: Evidence from online job postings", OECD Science, Technology and Industry Working Papers, No. 2021/03, OECD Publishing, Paris, https://doi.org/10.1787/3ed32d94-en

30. "The Future of Jobs Report 2023." World Economic Forum, April 30, 2023, https://www.weforum.org/publications/the-future-of-jobs-report-2023/

31. "The Future of Jobs in the Era of AI." Boston Consulting Group, 2021, https://www.bcg.com/publications/2021/impact-of-new-technologies-on-jobs

32. "UNESCO survey: Less than 10% of schools and universities have formal guidance on AI," 2023, https://www.unesco.org/en/articles/unesco-survey-less-10-schools-and-universities-have-formal-guidance-ai

33. "Would ChatGPT-facilitated programming mode impact college students' programming behaviors, performances, and perceptions? An empirical study." International Journal of Educational Technology in Higher Education, 2024, https://doi.org/10.1186/s41239-024-00446-5

34. "What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education." Smart Learn. Environ, 2023, https://doi.org/10.1186/s40561-023-00237-x

35. "Why Engineers Should Study Philosophy." Harvard Business Review, 2024, https://hbr.org/2024/04/why-engineers-should-study-philosophy

36. "Workplace Learning Report 2024." LinkedIn, 2024, https://learning.linkedin.com/content/dam/me/business/en-us/amp/learning-solutions/images/wlr-2024/LinkedIn-Workplace-Learning-Report-2024.pdf

37. Yusuf, A., Pervin, N. & Román-González, M. Generative AI and the future of higher education: a threat to academic integrity or reformation? Evidence from multicultural perspectives. International Journal of Educational Technology in Higher Education 21, 21 (2024). https://doi.org/10.1186/s41239-024-00453-6

38. "4 Things to Know about How Students View Community College AI Education." New America, 2024, https://www.newamerica.org/education-policy/edcentral/4-things-to-know-about-how-students-view-community-college-ai-education/