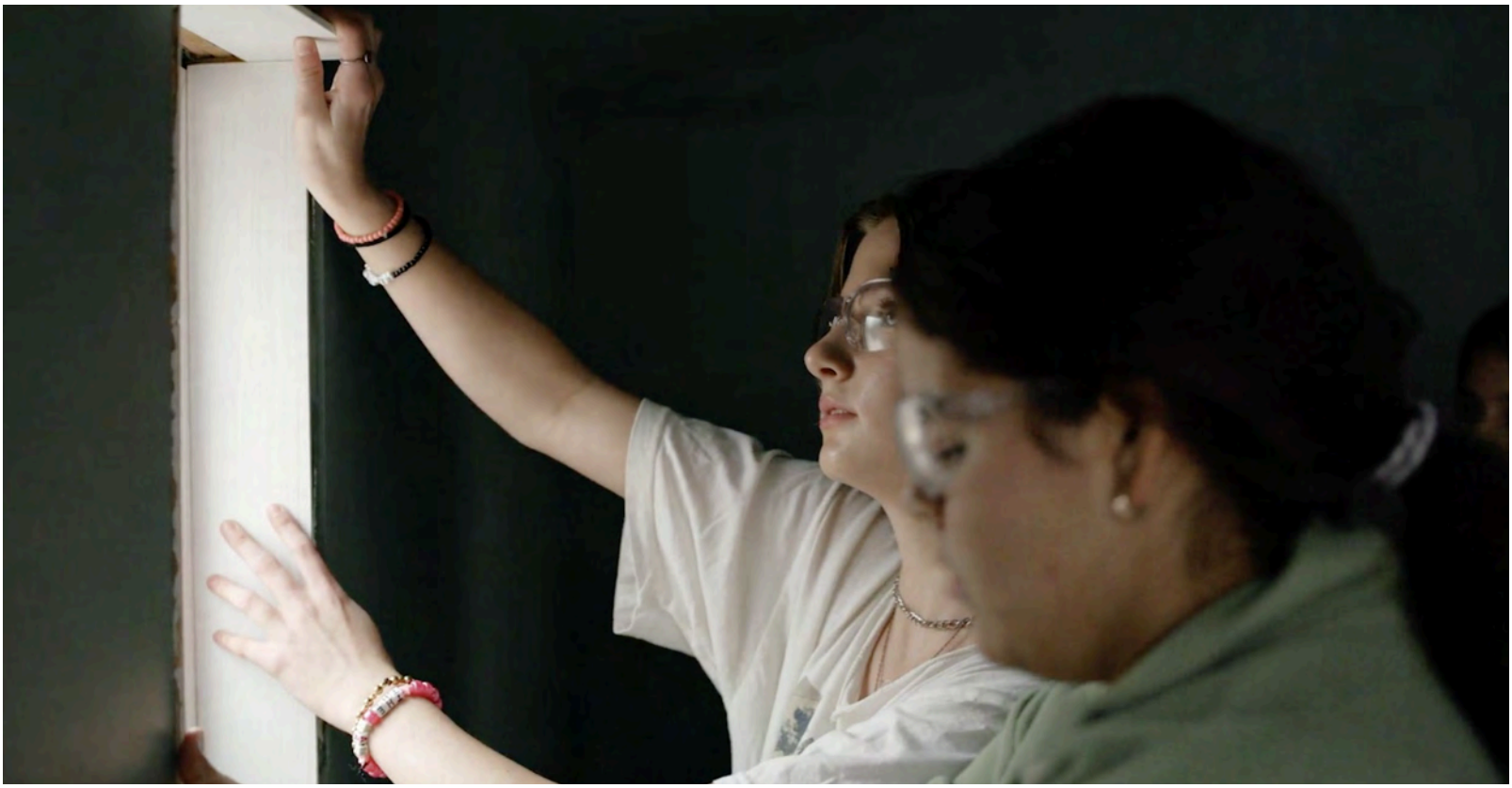
Human Skills in the Age of AI:

Why Essential Competencies Matter More Than Ever



By Karen L. Murphy, Ph.D.
and Alex Logan for LearnerStudio

High Resolves Group

LearnerStudio

MARCH 2025

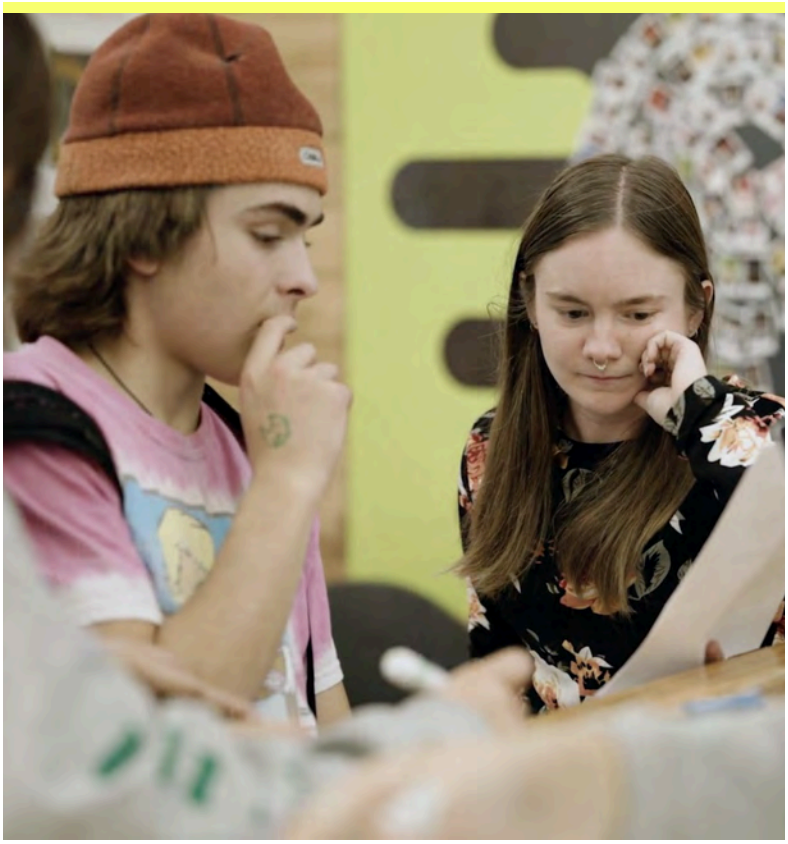
Foreword

In the final weeks of 2022, with little fanfare (and no news coverage whatsoever), OpenAI released a new product called ChatGPT.

Within a week, more than one million users had signed up. Two months later, that number had climbed to 100 million. And in a sense, humanity has been struggling to catch up ever since.

At LearnerStudio, we want to help spark the change that's needed to reinvent American education. The 2023 paper, *Building the Future of Learning*, marked our earliest effort to do so. And encouragingly, we were not alone—scores of our colleagues in the field were making their own recommendations about what young people need to thrive in this brave new chapter of human history.

This prompted us to ask: to what extent are all of these different frameworks aligned? Are they complementary? And might there be a way to synthesize them—not to create a new one-size-fits all mandate for assessment, but to support a shared conversation about what young people need in order to effectively navigate a fast-changing world? This paper, *Human Skills in the Age of AI*, provides a set of answers to those questions.



It was produced by our partners at High Resolves, who drew on and synthesized more than one hundred frameworks and research studies from across a wide variety of disciplines. Led by Dr. Karen Murphy, the team applied rigorous review, aided by advanced large language models, and distilled a set of twelve essential human skills required for a future-ready education system—including critical thinking, communication, resilience, leadership, and intercultural competence—plus two key cross-cutting abilities: transfer and agency.

In clarifying which human skills are most vital for the future, this report does not suggest those skills are more vital than content knowledge.

At LearnerStudio, we believe this is a false choice.

Knowledge and skills are inseparable. Academic content knowledge without skill development can feel disconnected and irrelevant. Skills, absent knowledge, are impossible to develop as they emerge in the context of knowledge building.

The imperative, therefore, is to modernize both what young people learn, and how we facilitate learning experiences to meet the demands of today's world—and inspire and prepare young people to flourish in the Age of AI.

For all of us working to reimagine the structure and purpose of that thing we call 'school,' we think this paper can serve as a powerful input to our shared efforts to respond to the increasing urgency that comes with this moment. We hope readers will not only engage deeply with the ideas presented here, but also reflect on how they can take action in their own communities and systems.

Building a future-ready learning ecosystem, after all, will require all of us.

1.0 Introduction

"Remember, today's AI is the worst AI you will ever use." This observation by Wharton Professor Ethan Mollick encapsulates a widespread sentiment about artificial intelligence: its capabilities will likely only continue to improve. While there's little doubt that generative AI is evolving with remarkable speed, these statements reflect a concerning passivity—as if technological development occurs independently of human agency rather than being actively shaped by human decisions and values. What's critical to remember as we navigate this new era is that humans must be in charge, not just "in the loop."

Our recent history with technologies like smartphones and social media provides a cautionary tale of letting technology outpace our ability to manage its impacts. While these tools have created remarkable opportunities for connection and information access, they've also contributed to increased isolation, decreased attention spans, compromised privacy, spreading disinformation, and deteriorating mental health, particularly among young people. Furthermore, generative AI is developing within a wider socio political and economic context which includes democratic fragility, political polarization, economic dislocation, growing inequality, identity-based divisions, and a climate crisis.

In the age of AI, and within the wider context of a polycrisis, developing and practicing essential human skills is more urgent than ever. With them, we will become better students, neighbors, employees, employers, and democratic citizens. We and our societies will be stronger and more resilient as we navigate these turbulent times.

The Essential Human Skills

Following an analysis of hundreds of different frameworks and organizational reports across fields of citizenship, civics, social-emotional learning, twenty-first century skills, career readiness, and employment sectors, we identified 12 essential human skills. Our research included influential frameworks from the Organization for Economic Co-operation and Development (OECD, 2019, 2023, 2024), Council of Europe (2018), World Economic Forum (2023), America Succeeds (2023), Center for Curriculum Redesign (Fadel et al., 2015; Fadel et al., 2024), UNESCO (Marope et al., 2017), UNICEF (2021), and the Collaborative for Academic, Social, and Emotional Learning (CASEL).

These essential human skills represent core competencies that—like the elements of the periodic table– are irreducible and elemental. We chose to avoid repetition and redundancy in favor of a focused approach based on learning science. In a time of overwhelming change and transformation, focusing on developing these twelve skills offers an achievable path forward for educators, students, employers, community members, and, what we must all become, lifelong learners.

Beyond these specific competencies, two meta-characteristics play crucial roles:

Transferability

The ability to apply skills across different contexts and domains, recognizing patterns and underlying principles. Transferability grows through deep understanding of each competency, practice in varied contexts, and reflection on how principles apply across situations.

Agency

A foundational meta-characteristic that underlies the exercise of all competencies. Agency represents the capacity to act and make choices, transforming knowledge into action across all domains. As Aneesh Raman, Chief Economic Opportunity Officer at LinkedIn, notes in his discussion of the future of work, "agency is key" in the new economy—individuals need both the skills themselves and the ability to deploy them effectively to pursue the work they want (Computerworld, 2025). According to Rebecca Winthrop “Young people need to recognize their agency not just in choosing how to participate in the digital world (or whether to participate at all) but in reimagining its very structure. Achieving meaningful change will require multiple approaches: regulation, public awareness campaigns, innovative technological solutions, and, crucially, education that helps us all see what’s possible” (Winthrop, 2025).

1. Critical Thinking

WHY IT MATTERS

Essential for analyzing information, solving problems, making decisions, and navigating complexity. Critical thinking enables humans to assess AI outputs, identify patterns, and evaluate claims with discernment.

KEY SUBCONSTRUCTS

Key Subconstructs: Problem-solving, decision-making, logical reasoning, analytical thinking, and systems thinking.

Research supports this: A 2024 study found that ChatGPT and other systems produced "hallucinated" references at rates ranging from 28.6% to 91.3% (Chelli et al., 2024). When AI systems are convincing but wrong, users often become less accurate than those not using AI because they "fall asleep at the wheel" and stop exercising critical judgment (Klein, 2024). The 2025 study by Lee et al. found that "higher confidence in GenAI's ability to perform a task is related to less critical thinking effort," suggesting that as AI becomes more sophisticated, humans may be less inclined to exercise their critical faculties. Abrami et al. (2015) conducted a meta-analysis of strategies for teaching critical thinking, finding that explicit instruction and practice in critical reasoning skills produces significant improvements in student outcomes. And, importantly, Lee's study does show that while higher confidence in GenAI is associated with less critical thinking, higher self-confidence is associated with more critical thinking.

2. Communication

WHY IT MATTERS

Fundamental for expressing ideas clearly, interpreting messages accurately, adapting to diverse audiences, and building relationships. In an AI-mediated world, authentic human communication remains essential for conveying nuance and maintaining connections.

KEY SUBCONSTRUCTS:

Verbal and written communication, active listening, storytelling, and persuasive communication.

In 2024, LinkedIn identified communication as number one in “Top Overall Skills.” Research also shows leaders need to communicate more. Francis Flynn and Chelsea Lide (2023) found that "leaders were, on average, nine times more likely to be criticized for under-communicating than overcommunicating," challenging assumptions about information overload and emphasizing that human communication involves not just information transfer but building trust and understanding. A 2023 study by Hohenstein et al. examined how algorithmic response suggestions affect interpersonal communication. While AI-suggested responses increased communication speed, people were "evaluated more negatively if they are suspected to be using algorithmic responses" (Hohenstein et al., 2023).

3. Adaptability

WHY IT MATTERS

Enables individuals to thrive amid rapid technological transformation, embracing new information, tools, and ways of working. As AI reshapes industries and roles, adaptability allows humans to pivot, reframe, and find opportunity in change.

KEY SUBCONSTRUCTS

Flexibility, openness to change, resourcefulness, and learning agility.

Research by Workday (2025) found that companies are actively seeking employees who can navigate uncertainty and continuous change, with their global study of 2,500 workers identifying "change tolerance" as one of the most lacking yet essential skills in organizations. LinkedIn is also highlighting adaptability as the “skill of the moment” with the most notable surge in year-over- year demand (Brodnitz, D., 2024).

4. Collaboration

WHY IT MATTERS

Working effectively with others across boundaries creates value that neither AI nor individual humans can achieve alone. Collaboration enables collective intelligence and the integration of diverse perspectives.

KEY SUBCONSTRUCTS

Teamwork, relationship building, conflict resolution, trust building, and inclusivity.

The Workday study (2025) found that "building bridges" across departments and teams was consistently valued, with leaders who could inspire collaborative problem-solving being particularly sought after. For Aneesh Roman, this shift is tied to a bigger one, the advent of the relationship economy. “The relationship economy is coming. In it, people skills and people to people collaboration will move to the center of work.”(Raman, 2024) Collaboration is also essential to thriving communities and to democracy.

5. Emotional Intelligence

WHY IT MATTERS

The ability to understand and manage emotions—both one's own and others'—remains uniquely human. It underpins meaningful relationships, effective communication, and psychological wellbeing in an increasingly digital world.

KEY SUBCONSTRUCTS:

Self-awareness, self-regulation, empathy, social awareness, and relationship management.

As AI connects people globally, emotional intelligence becomes increasingly important for navigating complex human interactions that technology cannot replicate. Emotional intelligence is also required to engage across our increasingly divided society as well as to navigate the multiple crises we face.

6. Resilience

WHY IT MATTERS

Essential for bouncing back from setbacks, managing stress, and maintaining wellbeing amid disruption. Resilience becomes increasingly vital as AI and automation transform careers and create social change.

KEY SUBCONSTRUCTS:

Perseverance, stress tolerance, grit, optimism, and emotional recovery.

Global studies by Bundle Skills (2025) found that resilience was consistently associated with higher performance in cross-functional and international teams. The World Economic Forum's Future of Jobs Report (2025) identified "resilience, flexibility, and agility" among the top skills rising in importance. McKinsey's Global Managing Partner Bob Sternfels described resilience as "a muscle that needs to be built" through intentional development and challenges (WEF, 2025). Resilience is positively correlated with psychological well-being.

7. Creativity

WHY IT MATTERS

The ability to understand and manage emotions—both one's own and others'—remains uniquely human. It underpins meaningful relationships, effective communication, and psychological wellbeing in an increasingly digital world.

KEY SUBCONSTRUCTS

Divergent thinking, convergent thinking, problem reframing, and innovation.

The Workday research (2025) found that 83% of respondents believe AI will "elevate the importance of uniquely human skills and enhance human creativity, leading to new forms of economic value." Human relationships in times of stress, including democracy itself, also require creativity, particularly as we navigate increasing turbulence and polarization.

8. Leadership

WHY IT MATTERS

Inspiring others, setting vision, and making ethical decisions for collective success requires distinctly human qualities. Leadership guides the responsible development and application of technology toward human flourishing.

KEY SUBCONSTRUCTS

Vision-setting, influence, team empowerment, decision-making, and accountability.

LinkedIn CEO Ryan Roslansky emphasizes that "no matter how advanced our technologies become, the need for human empathy, ethical judgment, and leadership cannot be replaced by AI" (LinkedIn, 2025).

9. Lifelong Learning

WHY IT MATTERS

A meta-competency enabling continuous growth and skill acquisition throughout changing circumstances. As AI accelerates the pace of change, the ability to continuously learn becomes essential for remaining relevant.

KEY SUBCONSTRUCTS:

Self-directed learning, growth mindset, curiosity, and knowledge transfer.

With such rapid technological change and a changing workplace, lifelong learning will become the norm. As Dr. Ehoneah Obed writes, “In an AI-driven world, education doesn’t stop after school. The most successful people will be those who continuously learn, experiment, and grow — not those who rely on AI to do all the thinking for them” (Obed, 2025). Lifelong learning will also bolster agency, ensuring that we are not passive consumers of AI–or passive learners, employees, employers, and citizens.

10. Digital Literacy

WHY IT MATTERS

The ability to navigate, evaluate, and leverage digital tools— including AI—is fundamental for effective participation in modern society. This includes understanding capabilities, limitations, and ethical implications of technology.

KEY SUBCONSTRUCTS

Data literacy, information literacy, AI literacy, cybersecurity awareness, and ethical digital practices.

The Tully et al. (2025) study revealed that lower AI literacy correlates with perceiving AI as "magical," highlighting the importance of demystifying these technologies. Critically, misinformation and disinformation are increasing and the negative impact cannot be overstated. Users must become digitally literate across media which includes staying abreast of changes in AI which will require patience and persistence. “As our lives become increasingly intertwined with AI-powered tools and systems, it’s more important than ever to equip young people with the skills and knowledge they need to engage with AI safely and responsibly,” writes Mac Bowley. “AI literacy isn’t just about understanding the technology — it’s about fostering critical conversations on how to integrate AI tools into our lives while minimizing potential harm — otherwise known as ‘AI safety’” (Werner, 2025).

11. Intercultural Competence

Why It Matters

As AI connects people globally and serves diverse populations, the ability to navigate cultural differences, recognize bias, and collaborate across boundaries becomes increasingly important.

Key Subconstructs:

Cultural awareness, sensitivity, cross-cultural communication, and diversity appreciation.

AI is trained on huge but biased data sets which reflect human biases. For example, Hu et al. (2025) research found that “LLMs could inadvertently reinforce or amplify such identity-based biases in humans, carrying implications for important societal issues such as intergroup conflict and political polarization.” Intercultural competence is essential for developing relationships and trust. This is a vital skill in our polarized and diverse society and in a national and global context in which we face multiple crises that demand collaboration.

12. Ethical Reasoning

Why It Matters

As AI systems make consequential decisions, human capacity for moral deliberation, value alignment, and ethical oversight becomes essential. Ethical reasoning ensures technology serves human flourishing and respects fundamental rights.

Key Subconstructs:

Ethical decision-making, moral reasoning, integrity, social responsibility, fairness, and accountability.

A comprehensive study by Workday (2025) across 22 countries found that ethical decision-making ranked as the most valuable human-centric skill both today and in a future shaped by full AI adoption. As innovation outpaces regulation, ethical judgment at home and in the workplace will become more crucial.

2.0 Why These Skills Matter More Than Ever

The development of these twelve essential skills is critical for several urgent reasons:

1 MAINTAINING HUMAN AGENCY

Our research consistently shows that AI presents both unprecedented opportunities and significant challenges. As Demis Hassabis of DeepMind notes, decisions about AI development often feel "balanced on the edge of a knife" (The Economist, 2025). By developing these essential skills, humans can maintain control over how AI is developed and deployed, ensuring it serves rather than undermines human flourishing.

Concrete examples of AI misuse underscore the importance of maintaining human agency. OpenAI has documented instances of AI tools being used in Chinese influence campaigns, including efforts to spread Spanish-language anti- American disinformation (Fried, 2025). In another troubling case from Spain, an algorithmic risk assessment tool called VioGén, used by Spanish police to classify domestic violence cases, was found to have significant flaws in how it assessed danger to victims. As reported by The New York Times (2024), the system repeatedly underestimated the risk to women who were later killed by their abusers. This case highlights how even well-intentioned AI systems require human oversight, critical thinking, and ethical judgment.

The studies by Bastani et al. (2024) on how AI impacts learning and Lee et al. (2025) on critical thinking both suggest that passive AI consumption can undermine rather than enhance human capabilities. As Lamont & Zarlengo (2023) found in their educational experiments, rather than abandoning traditional skills– such as writing–and turning them over to AI, the integration of generative AI as part of the writing process provides an opportunity to help clarify and strengthen uniquely human perspectives and abilities. We saw this with our research and writing, including the writing of this report. AI hallucinates and when this sometimes means that it makes up something nonsensical, it can also produce content with a confidence and assurance that belies its inaccuracy. This requires users to remain vigilant and check their work. At the same time, working with AI in conversation, particularly with some of the newer models such as Anthropic's Claude 3.7, is enjoyable and useful as these tools can act as a thinking and writing partner, or, as Ethan Mollick says, a "co-intelligence."

2 ADDRESSING WORKPLACE TRANSFORMATION

AI is rapidly changing the workplace, workforce, and economy. According to the World Economic Forum's Future of Jobs Report (2023), nearly one-quarter of all jobs globally are projected to change by 2027, with 69 million new job roles expected to be created and 83 million job roles expected to be displaced. AI expert Kai-Fu Lee predicts white-collar jobs will be disrupted faster, with about 50% of jobs potentially displaced by AI within 3 years. McKinsey & Co. estimates that by 2030, Europe and the United States could each require up to 12 million occupational transitions, suggesting massive workforce shifts ahead.

Workplace research consistently ranks interpersonal skills, communication, critical thinking, and ethical decision-making as the most valuable competencies in an AI-augmented environment (Pew Research, 2024; Workday, 2025). American workers agree. A 2024 Pew Research Center survey found that approximately 70% of workers consider interpersonal skills, communication, and critical thinking to be "extremely or very important" for workplace success. In contrast, only 35% assigned the same level of importance to AI skills.

In a Computerworld discussion on "AI, Jobs and the New World of Work," Aneesh Raman emphasized that social abilities are moving to the center of work value. "Our most competitive set of abilities are not physical or purely intellectual, but social—the intersection of EQ and IQ—creativity, curiosity, compassion, courage, communication—that have been undervalued as 'soft skills'" (Computerworld, 2025). Raman observed a shift where these previously undervalued human capabilities are becoming central precisely because of technological innovation.

Moreover, in their New York Times op-ed, Aneesh Raman from LinkedIn and Maria Flynn from Jobs for the Future reported that "Over 70 percent of executives surveyed by LinkedIn last year said soft skills were more important to their organizations than highly technical A.I. skills. And a recent Jobs for the Future survey found that 78 percent of the 10 top-employing occupations classified uniquely human skills and tasks as 'important' or 'very important.' These are skills like building interpersonal relationships, negotiating between parties and guiding and motivating teams."

However, there's a growing skills gap. McKinsey Global Institute's research (2024) identifies the "race to deploy AI and raise skills" as a critical challenge for companies worldwide, emphasizing that human skills development must keep pace with technological advancement. And Goldman Sachs' Global Managing Partner Marco Argenti recently argued that philosophy majors may be better suited for software engineering roles than traditional computer science graduates, explaining that with AI taking over most coding duties, companies now want engineers who excel at critical thinking and communication (LinkedIn News, 2025).

3 CREATING MORE EQUITABLE SOCIETIES

The digital divide research (Greenstein & Sadun, 2024) and findings on differential AI impacts across demographics (Wang et al., 2025) make clear that without intentional intervention, AI may widen rather than narrow social gaps. Harvard Business School research revealed a vast "digital divide" across U.S. households, with significant disparities in digital usage reflecting an urban-rural divide and correlating strongly with income and education levels (Greenstein & Sadun, 2024).

Research from the Education Recovery Scorecard (2025) shows that educational equity gaps widened dramatically during the COVID-19 pandemic, with many districts experiencing severe learning losses that disproportionately affected low- income students and students of color. These existing inequities create a foundation for AI to potentially widen societal divides exponentially as those with access to AI tools, training, and the essential skills to use them effectively gain advantages in education and the workplace, while those without these resources fall further behind.

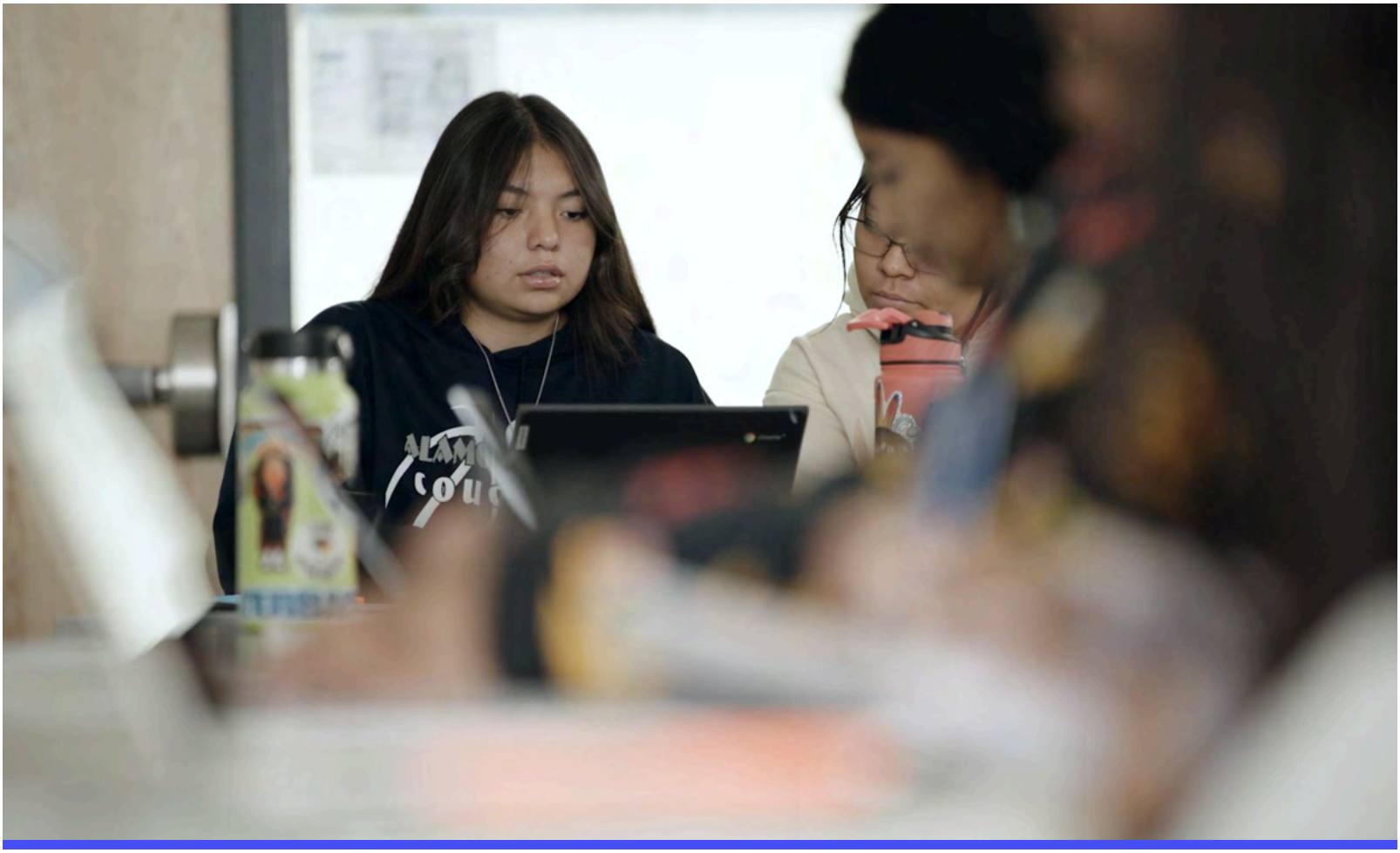
Developing essential human skills equitably across all populations is therefore critical to preventing AI from becoming another vector of social stratification.

4 NAVIGATING AN INCREASINGLY UNREGULATED LANDSCAPE

In the US, the current administration has rolled back the last administration's guidelines, while the recent Paris AI conference largely abandoned safety regulations in favor of innovation. As Ian Krietzberg reports in 'The misguided race to regulation', the regulatory landscape remains fragmented and inconsistent. I am reminded of what Dr. Seena Rejal, CCO of the AI startup NetMind, told me recently, that policymakers can't keep up with AI because they don't 'really understand it at its core.'' (Krietzberg, 2025). This knowledge gap between technologists and regulators presents a fundamental challenge to creating effective governance frameworks.

This disconnect exemplifies a broader issue in AI governance: the tension between promoting innovation and ensuring responsible development. When regulators lack technical expertise, they often produce either overly restrictive policies that stifle progress or inadequate frameworks that fail to address genuine risks. The frequent policy reversals between administrations further complicate this landscape, creating uncertainty for businesses and researchers alike.

Moreover, the international fragmentation of AI regulation—highlighted by the Paris conference's shift away from safety measures—creates a regulatory patchwork that makes global coordination increasingly difficult. Companies developing AI systems must navigate these inconsistent requirements while the technology itself continues to advance at an unprecedented pace, widening the gap between governance and innovation with each passing day.



5 MITIGATING PSYCHOLOGICAL HARM AND MISUSE

There is growing evidence of psychological risks associated with AI technologies. Services like Character.AI, with , have raised concerns about dependency and psychological impacts, particularly among vulnerable populations (Wong, 2025). The American Psychological Association has also warned federal regulators about "AI chatbots 'masquerading as therapists" that might "drive vulnerable people to harm themselves or others" (Barry, 2025). These concerns highlight the need for emotional intelligence, critical thinking, and ethical reasoning to guide appropriate human-AI interactions.

6 ADDRESSING EDUCATIONAL AND CIVIC KNOWLEDGE DEFICITS

AI is emerging in a troubling educational and civic context that makes the development of these essential skills even more critical:

The education sector has struggled to adapt to AI. Following ChatGPT's release, many school systems initially responded by blocking access, citing concerns about cheating. During this period, tech companies continued developing more advanced AI models while education missed a critical opportunity for professional development and policy creation.

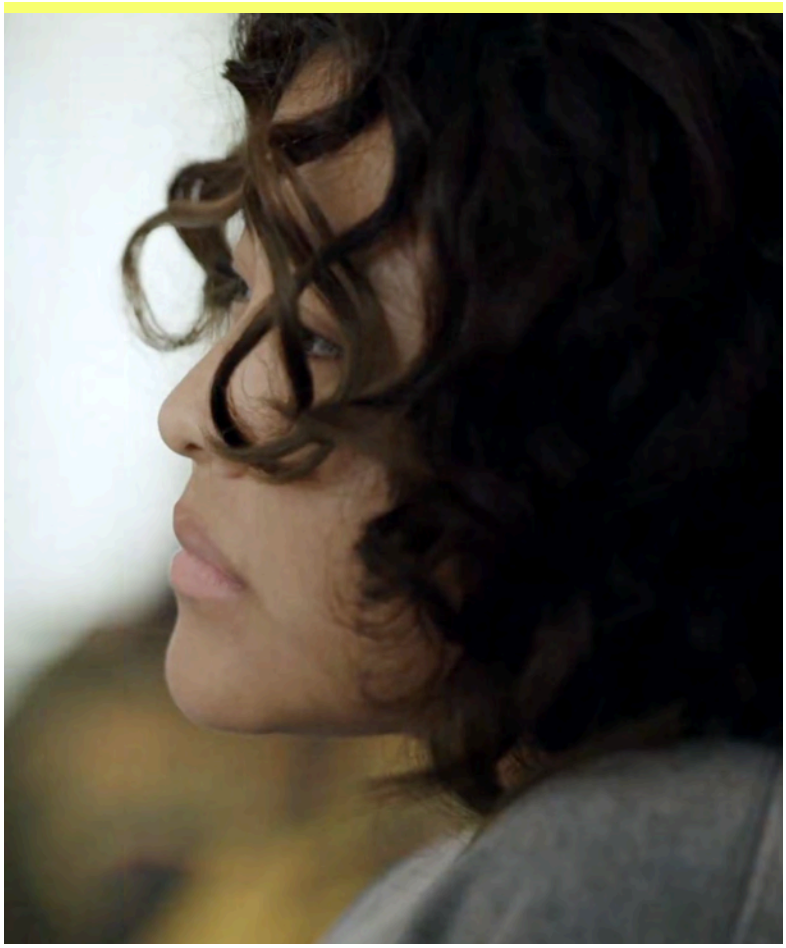
There is also a good deal of evidence that shows we are ill-prepared. U.S. 8th graders' digital literacy skills declined between 2018 and 2023 on the International Computer and Information Literacy Study (Langreo, 2024), suggesting students are less prepared for the digital world at precisely the time when such skills are most crucial. A concerning pattern has also emerged in educational settings: the diminishing engagement with long-form reading. **A 2023 National Assessment of Educational Progress report found that only 14% of 13-year-olds reported reading for fun "almost every day," down from 35% in 1984.** This decline in reading engagement correlates with decreasing performance on information literacy measures (North, 2024). We also have an adult literacy gap. The OECD Survey of Adults Skills (2024) found declining literacy and numeracy skills across the United States, with **28% of adults scoring at Level 1 or below in literacy and 34% at or below Level 1 in numeracy.**

We also have a civic knowledge gap. Two recent examples: The Annenberg Constitution Day Civics Survey found that less than half of Americans can name most of the rights protected under the First Amendment, indicating serious gaps in civic literacy that may hamper informed public engagement with AI policy and governance (Annenberg Public Policy Center, 2024).

And, according to the U.S. Chamber of Commerce Foundation, their survey "finds **more than 70% of Americans fail a basic civic literacy quiz on topics like the three branches of government, the number of Supreme Court justices, and other basic functions of our democracy.** Just half were able to correctly name the branch of government where bills become laws.

While two thirds of Americans say they studied civics in high school, **just 25% say they are "very confident" they could explain how our system of government works."** (US Chamber of Commerce Foundation, 2024)

These educational and civic knowledge gaps make the intentional development of our 12 essential skills even more urgent, as they provide the foundation for informed engagement with rapidly advancing technologies.



3.0 Partnering with Generative AI

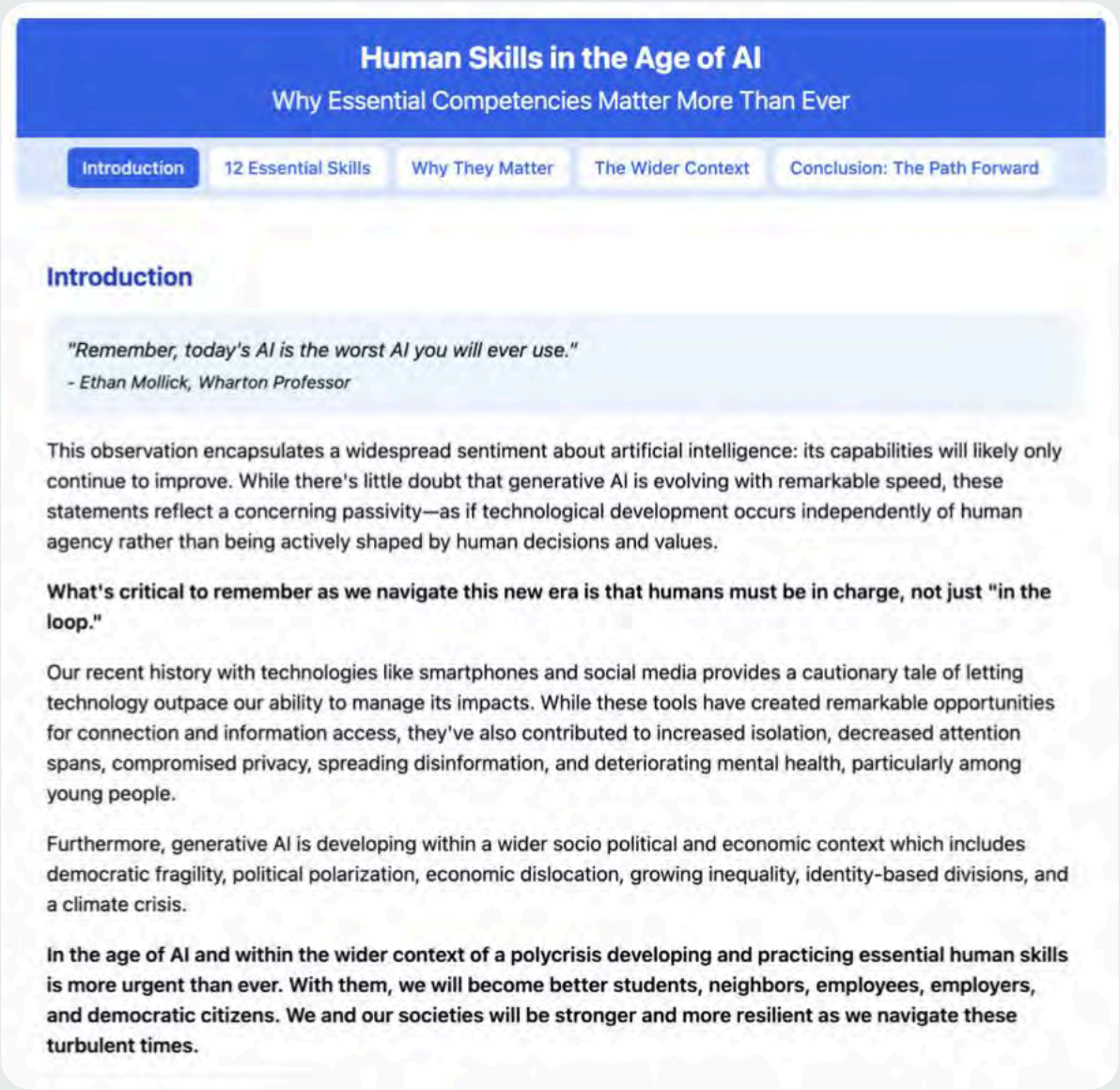
AI played a substantial part in the research for this project and in the writing of this paper. We began our research with a focus on a hypothesis that essential capacities (constructs) like critical thinking are made up of a relatively small number of elements (sub constructs). Rather than assuming "soft skills" are made up of hundreds of sub constructs, we argued that there are essential building blocks that underpin these capacities and together they constitute an underlying grammar. The possibility of a "periodic table"1 of soft skills elements (sub constructs), we said, invites exciting opportunities, including increasing our ability to define, develop, and measure these capacities in educational institutions and workplaces across industries.

While we identified at least one hundred important organizations, frameworks, and research papers to begin, we trained OpenAI GPTs to help us find more.

We also brought these GPTs in conversation with each other and with Anthropic's Claude. We did find that the GPTs hallucinated, making up research and enthusiastically supplying us with frameworks by organizations that did not exist. We recognized this because we were reading and checking everything the GPTs produced. We began to do research with the GPTs as backup tools, and we used Google's Notebook LM as an analysis tool. The advantage of this AI tool is that it draws on the sources that the user uploads rather than searching the internet in general, and it offers citations so that the user can see the specific evidence it uses to formulate its analysis. This meant that we could upload frameworks and research that we had read and analyzed and use Notebook to cross reference them as well as align them with each other. In addition, we used Claude, a family of large language models developed by Anthropic to check our work, and to act as a "co-intelligence," offering feedback on our analysis and sharing ideas. We then integrated GPTs which provided an additional opportunity to check our work and our thinking. In addition, we trained a few GPTs in narrower ways. We created one whose job was to crosswalk frameworks. We trained another to act as a "skills storyteller," helping users to do a skills audit and to tell a story of their skills by drawing on the methodology of Dr. Martin Gans.

For the second phase of our research, we focused on the topic of this paper, the essential human skills in the age of AI. We drew on the immense body of research we generated in phase one as well as new resources. Claude acted as a thought partner, helping us to sift through our research, presenting ways to frame it, and offering feedback. Claude also created an interactive presentation to accompany the paper, distilling a 40-page draft into a neat, accurate, interactive version.

[1] Credit goes to Mehrdad Baghai, co-founder of High Resolves, for the idea of thinking in terms of a periodic table and to High Resolves for initial research on subconstructs which led us down this path. For more on High Resolves work on assessment see High Resolves' (2020) The Future of Assessment: White Paper 2. High Resolves intentionally uses the terminology of citizenship education over civics and civic learning. They write, "Since citizenship education is the most systemic and broad term, it is the one we will use as we make a case for a new system of assessment so that democracy and our global community can thrive." In this paper, we refer to human skills as we are making a case considering the role of humans in relationship to generative AI and because our research was broader than citizenship education, including professional learning and workplace readiness.

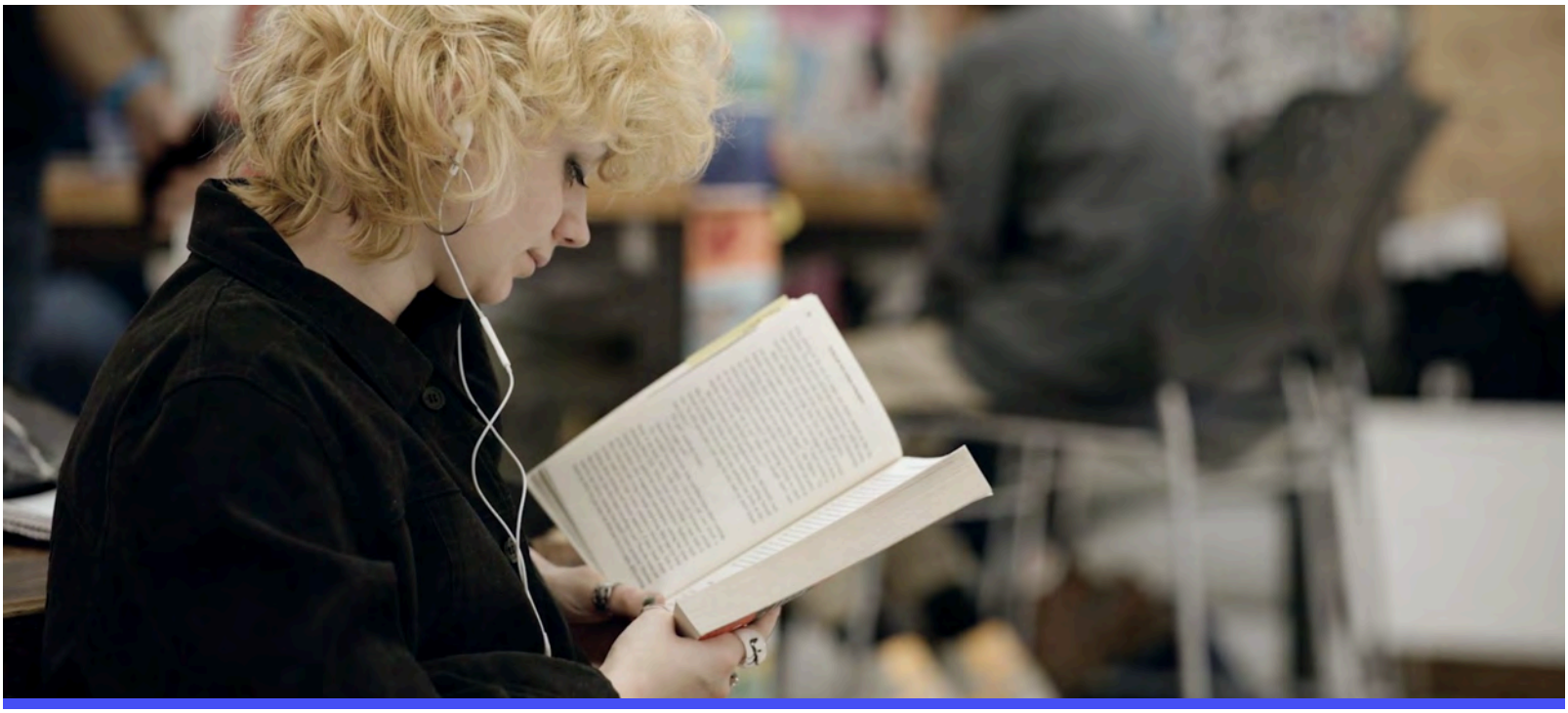


> Overall, we found using the tools to be enormously helpful. They saved time, offered different perspectives and approaches, and they were fun to use. And, while using them we had to employ the very human skills that we write about here.

4.0 Conclusion: The Path Forward

The path forward requires a multi-faceted approach that encompasses educational systems, workplace practices, policy frameworks, and individual development. The challenges we face are substantial and multidimensional: growing digital divides, spreading disinformation, deteriorating civic literacy, declining reading engagement, psychological dependencies on AI, therapeutic misuse, and cognitive dependency all threaten to undermine both individual agency and collective democracy. Yet the opportunities are significant. AI could help democratize education, empower creativity, solve intractable problems, and free human attention for deeper pursuits. By focusing on the development of these twelve essential human skills—from critical thinking and communication to ethical reasoning and lifelong learning— we can ensure that AI serves as a tool for human empowerment rather than replacement. We reached out to Ian Krietzberg, Editor-in-Chief at the Deep View, a daily newsletter on AI, for his views. He responded, “stories and art - especially challenging stories, especially stories whose message we disagree with - are windows into worlds beyond our sphere of experience. And seeing beyond ourselves allows us to understand others; despite all the automation that may or may not come, this is, at the end of the day, a world of living, breathing, feeling, thinking humans, humans who we war with, humans who laugh with, humans who we must get along with. Losing that would be a shame. The only way not to lose those things that will hold us all together is to live very conscious, purposeful lives, something that ought to be heightened when we interact with generative AI. Know why you're using it. Know what the costs are. Understand the context of the solution. Understand where it comes from, and what it allows you to accomplish.”

The time for such thoughtful investigation and intentional development is now. By cultivating essential human skills in ourselves and the next generation, we can ensure that AI's exponential progress translates to exponential human flourishing rather than diminishment.



References

Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, C. A., & Persson, T. (2015). Strategies for teaching students to think critically: A meta- analysis. Review of Educational Research, 85(2), 275–314.

America Succeeds. (2023). Durable skills advantage framework starter edition. Annenberg Public Policy Center. (2024). A Majority of Americans Can't Recall MostFirst Amendment Rights.

Barry, E. (2025, February 24). Human Therapists Prepare for Battle Against A.I. Pretenders. The New York Times.

Bastani, Hamsa and Bastani, Osbert and Sungu, Alp and Ge, Haosen and Kabakcı, Özge and Mariman, Rei, Generative AI Can Harm Learning (July 15, 2024). The Wharton School Research Paper, Available at SSRN: https://ssrn.com/abstract=4895486 or http://dx.doi.org/10.2139/ssrn.4895486

Bill of Rights Institute. (2024). Educ ating for self-governance. [Video]. https://billofrightsinstitute.org/educating-for-self-governance

Brodnitz, D. (2024, February 8). The most in-demand skills for 2024. LinkedIn Business. https://www.linkedin.com/business/talent/blog/talent-strategy/linkedin- most-in-demand-hard-and-soft-skills

Bundle Skills. (2025). Global Workforce Resilience Study.

Chelli, M., Descamps, J., Lavoué, V., Trojani, C., Azar, M., Deckert, M., Raynier, J., Clowez, G., Boileau, P., & Ruetsch-Chelli, C. (2024). Hallucination Rates and Reference Accuracy of ChatGPT and Bard for Systematic Reviews: Comparative Analysis. Journal of Medical Internet Research, 26, e53164.

CASEL. What is the CASEL Framework? https://casel.org/fundamentals-of- sel/what-is-the-casel-framework/

CASEL. (2020) CASEL'S SEL FRAMEWORK: What Are the Core Competence Areas and Where Are They Promoted? https://casel.org/casel-sel-framework-11- 2020/?view=1

Council of Europe. (2018). Reference framework of competences for democratic culture. Council of Europe Publishing.

Denham, Susanne A. (2018, November). Keeping SEL Developmental: The Importance of a Developmental Lens for Fostering and Assessing SEL Competencies. FRAMEWORKS BRIEFS special issues series NOVEMBER 2018. American Institute of Research; Arlington. https://casel.s3.us-east- 2.amazonaws.com/CASEL-Resources-Keeping-SEL-Developmental.pdf

Flynn, F., & Lide, C. (2023). Leadership Communication in Digital Workplaces. Harvard Business Review.

Ford, C. (2025, February 19). Meta's brain-to-text tech is here. We are not remotely ready. Vox Future Perfect.

Fried, Ina. (2025, February 21)OpenAI finds new Chinese influence campaigns using its tools. Axios. https://www.axios.com/2025/02/21/openai-chinese- influence-campaigns

Greenstein, S., & Sadun, R. (2024). America's Digital Divide: Where Workers Are Falling Behind. Harvard Business School Working Knowledge.

Hassabis, D. (2025, February 18). AI bosses on what keeps them up at night. The Economist.

High Resolves. (2020). The Future of Assessment: White Paper 2.

References

Hohenstein, J., et al. (2023). Algorithmic Response Suggestions and Interpersonal Communication. Journal of Computer-Mediated Communication.

Hu, T., Kyrychenko, Y., Rathje, S. et al. Generative language models exhibit social identity biases. Nat Comput Sci 5, 65–75 (2025). https://doi.org/10.1038/s43588-024- 00741-1

Klein, E. (2024, April 2). Ezra Klein interviews Ethan Mollick [Transcript]. The New York Times.

Krietzberg, I. (2025, February 26). The misguided race to regulation. The Deep View.

Lamont, M., & Zarlengo, K. (2023, December 20). Why make students write in the age of AI? Medium.

Langreo, L. (2024, December 2). U.S. Students' Computer Literacy Performance Drops. EdWeek.

Lee, H., et al. (2025). The Impact of Generative AI on Critical Thinking. Computers in Human Behavior.

LinkedIn. (2024). Workplace learning report 2024.

LinkedIn Skills-First. (2023). Reimagining the labor market and breaking down barriers.

LinkedIn Learning. (2024). Why CEOs say emotional intelligence is their new priority. [Video].

McKinsey Global Institute. (2024, May 21). A new future of work: The race to deploy AI and raise skills in Europe and beyond [Report]. McKinsey & Company.

North, A. (2024). The Decline in Reading Engagement Among American Youth. Literacy Research Association.

Obed, Ehoneah (2025). Lifelong Learning in the Age of Generative AI: Why It Matters More Than Ever. Medium. https://medium.com/@ehoneahobed/lifelong- learning-in-the-age-of-generative-ai-why-it-matters-more-than-ever- a3cd1761b060

OECD. (2019). OECD Learning Compass 2030: A framework for the future of education. OECD.

OECD. (2023). OECD skills outlook 2023: Skills for a resilient green and digital transition. OECD Publishing.

OECD. (2024). Survey of Adult Skills. Programme for the International Assessment of Adult Competencies (PIAAC).

Pew Research Center. (2024, December 6). Job skills and training.

Raman, Aneesh. (2024) LinkedIn post. https://www.linkedin.com/posts/aneeshraman_an-ode-to-immigrants-and- refugees-the-relationship-activity-7254940178606170112-yVBt

Raman, A., & Flynn, M. (2024, February 14). When your technical skills are eclipsed, your humanity will matter more than ever. The New York Times. https://www.nytimes.com/2024/02/14/opinion/ai-economy-jobs-colleges.html

Riley, B. (2024, July 16). AI is Another Ed Tech Promise Destined to Fail. The 74.

Smith, J. (2023, October 11). The importance of emotional intelligence in business leadership. Forbes. https://www.forbes.com/councils/forbesbusinesscouncil/2023/10/11/the - importance-of-emotional-intelligence-in-business-leadership/

References

Torchio, G., & Tasin, F. (2025, February 14). The Paris Summit: Au Revoir, global AI Safety? European Policy Centre. https://epc.eu/en/Publications/The-Paris-Summit- Au-Revoir-global-AI-Safety~61ea68

Tully, S., Longoni, C., & Appel, G. (2023, June 16). Lower Artificial Intelligence Literacy Predicts Greater AI Receptivity. https://doi.org/10.31234/osf.io/t9u8g

UNESCO. (2022). Reimagining our futures together: A new social contract for education.

UNICEF. (2021). The 12 transferable skills.

UNICEF. (n.d.). Comprehensive life skills framework. https://www.unicef.org/india/media/2571/file/Comprehensive-lifeskills- framework.pdf

US Chamber of Commerce Foundation. (2024, 12 February). New Study Finds Alarming Lack of Civic Literacy Among Americans Amidst growing polarization, workplaces emerge as rare unifying civic force. https://www.uschamberfoundation.org/civics/new-study-finds-alarming-lack-of- civic-literacy-among-americans

Wei, J., Nguyen, K., Chung, H. W., Jiao, Y. J., Papay, S., Glaese, A., Schulman, J., & Fedus, W. (2024). Measuring short-form factuality in large language models. OpenAI. https://github.com/openai/simple-ev

Werner, John. (2025, 27 January) AI Innovation Brings Imaginative Possibility, But Also Risk. Forbes https://www.forbes.com/sites/johnwerner/2025/01/27/ai- innovation-brings-imaginative-possibility-but-also-risk/

Winthrop, R. (2025, February 11). The need for an agentic mindset in technology. LinkedIn. https://www.linkedin.com/pulse/need-agentic-mindset-technology- rebecca-winthrop-qrb3c/

Workday. (2025). Global Study: Elevating Human Potential: The AI Skills Revolution.

World Economic Forum. (2023). The future of jobs report 2023.

World Economic Forum. (2023). Defining education 4.0: A taxonomy for the future of learning. https://www3.weforum.org/docs/WEF_Defining_Education_4.0_2023.pdf

World Economic Forum. (2023). Putting skills first: A framework for action.

World Economic Forum. (2025). Future of jobs report. Retrieved from https://reports.weforum.org/docs/WEF_Future_of_Jobs_Report_2025.pdf

Wong, Q. (2025, February 25). Teens are spilling dark thoughts to AI chatbots. Who's to blame when something goes wrong? LA Times.