

C1: disabilities

The number of students who learn differently has risen drastically in recent years.

Pendharkar, Eesha. "The Number of Students in Special Education Has Doubled in the Past 45 Years."

Education Week, July 31, 2023,

<https://www.edweek.org/teaching-learning/the-number-of-students-in-special-education-has-doubled-in-the-past-45-years/2023/07>. Accessed February 10, 2025. . [Reporter with national journalism experience covering race, equity, and education across the country, as well as data reporting. Have several years of experience covering a wide variety of beats from breaking news to politics, transportation, the environment, and housing etc. Data coach and FOIA enthusiast. Education from boston college] //aashna

The number of students in special education in the United States has doubled over the past four decades, creating a rising share of public school kids who need special education services. That's according to the Pew Research Center, which collected data from the National Center for Education Statistics for a report on students in special education for Disability Pride Month, which is celebrated each year in July. The total number of students in special education went from 3.6 million in the 1976-77 school year, to almost 7.3 million in 2021-22. These students now make up 15 percent of the K-12 student population across the country, nearly double what it was in the late 1970s.

These students are under threat, with funding potentially being cut for IEP programs.

Mueller, Chris. "Does Project 2025 eliminate IEPs? Not explicitly, but experts are wary." USA Today,

November 19, 2024,

<https://www.usatoday.com/story/news/factcheck/2024/11/15/project-2025-ieps/76045183007/>.

Accessed February 10, 2025. [results-oriented IT leader who optimizes companies' performance and accelerates ROI by delivering innovative business and technology solutions through Agile methodologies. a track record of building high-performing development and project teams through focused resource and performance management, training, and staff mentorship.. a Development & Delivery Manager at Sabre, where I lead the Agile design, development, operation, and maintenance of cloud-based software platforms.] //aashna

Abery said the change to block grants would make it possible for those special education funds to be used outside of public schools – at a private school, for instance. "(Public) schools would have less money to effectively implement IEPs because it would be siphoned off to a certain extent to private schools," Abery said. The federal government wouldn't set any minimum standards for states to receive the funding, hence the "no strings" language, Houck said. "In this way, it is conceivable that students in some states would be underfunded or eliminated from funding," he said.

Generative AI helps teachers differentiate instruction without having to work outside the classroom.

FX Media. "AI in Education: Enhancing Accessibility and Inclusivity for Individuals with Disabilities",

August 20, 2024,

<https://www.fxmweb.com/insights/ai-in-education-enhancing-accessibility-and-inclusivity-for-individuals-with-disabilities.html#:~:text=Generative%20AI%2C%20a%20subset%20of,disabilities%20achieve%20the%20full%20potential> [A dedicated team of expertise who has a passion for Web, Mobile, and Immersive Multimedia] //noush

Artificial intelligence (AI) is revolutionizing various sectors, and education is no exception. With its ability to process vast amounts of data and generate tailored solutions, this technology holds immense potential for transforming educational experiences, especially for individuals with disabilities. By enhancing accessibility and inclusivity, AI paves the way for a more equitable education system that accommodates the diverse

needs of all learners. In this article, we delve into how AI reshapes education for individuals with disabilities, making learning more accessible, inclusive, and personalized. The Role of AI in Enhancing Accessibility. AI-driven technologies are crucial in breaking down barriers that individuals with disabilities often face in educational settings. These barriers, ranging from physical to cognitive challenges, can hinder a student's ability to engage fully in learning activities. AI tools like speech recognition, text-to-speech converters, and real-time transcription services are becoming invaluable in creating an inclusive environment where all students can thrive. For instance, speech recognition technology can aid students with mobility impairments by allowing them to control computers and other devices through voice commands [1]. Similarly, text-to-speech software supports students with visual impairments, enabling them to access written content audibly [2]. These technologies not only enhance accessibility but also empower students to participate more actively in their education, fostering a sense of independence and confidence. Personalized Learning Experiences. AI's ability to analyze data and adapt to individual needs makes it a powerful tool for personalized learning. For students with disabilities, educational content and teaching methods can be tailored to suit their unique requirements. AI can assess a student's learning style, pace, and preferences, providing customized resources that cater to their specific needs [3]. This personalized approach is particularly beneficial for students with learning disabilities, as it allows them to grasp concepts at their own pace without feeling pressured to keep up with their peers. AI-driven platforms can also identify areas where a student may need additional support and provide targeted interventions. For example, an AI system can monitor a student's progress in real time and suggest supplementary exercises or alternative explanations if the student is struggling with a particular topic [4]. This level of customization ensures that all students, regardless of their abilities, receive the support they need to succeed academically.

Disability access in education helps students overcome barriers

Stevens, Jaclyn. "Ensuring Inclusive Learning: The Importance of Accessibility Practices in K-12 Classrooms." William & Ida Friday Institute for Educational Innovation, October 23, 2023, <https://fi.ncsu.edu/news/ensuring-inclusive-learning-the-importance-of-accessibility-practices-in-k-12-classrooms/>. Accessed February 10, 2025. /education from providence university] /aashna

Accessibility tools and resources integrated into curriculum and instruction paves the way for each student to access what they need to excel in their educational journey. These tools level the playing field, ensuring that students with varying abilities and learning styles can fully engage with the curriculum. By embracing accessibility, educators empower students to overcome barriers, making education more inclusive and equitable. For example, providing text alternatives for images or captions for videos benefits not only students with disabilities but also those who learn better through reading or have limited access to audiovisual content.

It has benefited several students with disabilities.

Audrey Been. "With \$1.87M, Researchers Continue to Test How AI Can Support Special Education", September 9, 2024, <https://education.virginia.edu/news-stories/187m-researchers-continue-test-how-ai-can-support-special-education> [Senior Associate Director of Communications, University of Virginia] //noush

UVA School of Education and Human Development Professor Michael Kennedy and his team have been awarded \$1,875,000 from the U.S. Department of Education's Office of Special Education Programs. This award comes on the heels of a \$2.5M grant the team received from the same organization last fall. Both projects aim to test how artificial intelligence can improve the teaching and learning of students with disabilities. With the new grant which will fund 100% of this new project, Kennedy and his colleagues will test how AI can support the creation of specific materials needed for teaching math and science vocabulary. For five years,

Kennedy and his team tested their evidence-based vocabulary practices with nearly 40 fifth through eighth grade science teachers. The study found **significant positive impacts for thousands of students**. But creating the materials is time consuming. "We've been making materials by hand for years, and it takes a long time to make sure the content is accurate to state standards," Kennedy said. "It's an intensive, expensive process. But what if AI is to the place where it could spit out quality materials that are in the neighborhood of what we've been doing by hand? Even if we had to tweak and modify them, that would be major."

C2: innovation

JOSEPH BRUSUELAS AND TUAN **NGUYEN**. "Market minute: Soft economic landing at risk," Feb 20, 20**25**.
<https://realeconomy.rsmus.com/market-minute-how-tariffs-put-the-soft-landing-at-risk/> [A member of the Wall Street Journal's forecasting panel and the UCLA Anderson School of Management's Board of Directors, Tuan Nguyen is an economist at RSM US LLP who analyzes high-frequency economic data within the United States and global economies to better understand the American middle market.] //aashna

Market minute: **Soft economic landing at risk** The Federal Reserve is on the verge of achieving that rarest of economic feats: A soft landing. The rapid disinflation that the Fed has engineered over the past two years mirrors that of the 1990s—the last time the central bank achieved such a difficult feat. That disinflation set the stage for a long period of productivity gains and low inflation, driven by technological advancement and open trade policies. During that time, productivity increased by well above 2% a year, while disinflation, and in some cases outright deflation, kept import prices in check. Read more of RSM's insights on the economy and the middle market. **Now, improving labor productivity, advances in a** Artificial Intelligence and the Federal Reserve's progress toward its 2% inflation target have all given rise to the prospect that a similar kind of sustained expansion can be replicated. The potential gains are significant. The **U.S.**, with services accounting for about two-thirds of total spending, **could reap tremendous benefits from** the widespread implementation of **AI** with **in** the **service sector**. **That** adoption **would** almost certainly **spill over** into the tradables sector, setting the stage for an AI-driven boom.

AI enhances students' academic skills.

University of **Iowa**. "The Role of AI in Modern Education." The University of Iowa, **2024**.
<https://onlineprograms.education.uiowa.edu/blog/role-of-ai-in-modern-education#:~:text=AI%20in%20education%20facilitates%20individualized,%2C%20and%20resource%2Dconstrained%20schools.>
[written by researchers at iowa univeristy] //noush

AI is transforming K-12 education by offering innovative solutions in personalized learning, adaptive learning platforms, intelligent tutoring systems, automated grading and feedback, and administrative tasks. **Personalized learning**. **AI** in education **facilitates individualized learning** by **tailoring instructional content to individual student needs**, **benefiting** students, teachers, and **resource-constrained schools**. This approach allows **students** to **progress at their own pace**, engage with activities aligned with their learning styles, **and gain** more **autonomy over** their **educational journeys**. Using AI assistants to differentiate assignments and devise data-driven, adaptive practices enhances the overall learning experience with minimal increase to the teacher's workload. Intelligent tutoring systems. **AI tutor systems** can provide adaptive, accessible learning experiences, **offering immediate feedback and corrective guidance** based on student performance. These applications of modern educational technology are helping to close learning gaps, improve conceptual understanding, and free up teacher time by handling routine instructional tasks and providing detailed data on the student's learning process. Automated grading and feedback. Traditional grading for written work often involves subjectivity and biases, as teachers' evaluations can be influenced by personal preferences, moods, and unconscious prejudices. This lack of objectivity can result in inconsistent and unfair assessments. Additionally, the time-consuming nature of grading large numbers of assignments limits teachers' capacity to provide thorough feedback, potentially hindering student learning. Integrating AI into the grading process is

revolutionizing traditional approaches to evaluating student performance. **AI can enhance grading efficiency**, precision, and fairness by **significantly reducing grading time** and providing instant, detailed feedback. This allows teachers to assign more writing tasks **and** offer **timely, constructive feedback**, which **fosters better writing skills in students**. However, it's essential that teachers critically review AI-generated feedback to ensure it aligns with educational goals and addresses individual student needs. AI tools should be seen as assistants rather than replacements, helping teachers focus on assessing creativity and critical thinking while AI assists teachers with more objective metrics like grammar and structure. By staying engaged in the grading process and spot-checking AI output, teachers can maintain the integrity of assessments and ensure students receive meaningful and accurate feedback. Administrative applications. Artificial intelligence tools can streamline lesson planning and content creation, saving teachers valuable time. These AI tools can **generate high-quality images, customized content**, and focused research materials under tight time constraints. By using AI for efficient research and content generation, **teachers** can **enhance lesson quality** without increasing their workload, ultimately **benefiting both students and resource-constrained schools**. School principals can also leverage AI technologies to reduce their substantial administrative burdens. AI chatbots assist with automating administrative tasks such as drafting emails, organizing schedules, and developing professional development sessions. AI models can be used to analyze large datasets to inform decision-making, like scheduling summer classes based on parent preferences. This allows administrators to focus more on strategic initiatives, human interaction and relationship-building.

AI is a Catalyst For Innovation And Creativity

Ray **Ravaglia**. "Teaching Innovation And Creativity: Duncan Wardle's Imagination Emporium" Feb 13, 20**25**. <https://www.forbes.com/sites/rayravaglia/2025/02/13/teaching-innovation--creativity-duncan-wardles-imaginatio-n-emporium/> [Contributor. Ray Ravaglia covers education, focusing on technology and innovation.] //aashna //recut nough

Perhaps the most innovative feature of *The Imagination Emporium* is its **AI-powered tool, brAln**. Designed as a WhatsApp chatbot, brAln **acts as an always-available virtual creativity coach**, assisting users to overcome creative blocks, generate new ideas, and implement brainstorming techniques in real time. By offering on-demand guidance inspired by the book, brAln **transforms innovation training into an ongoing process** rather than a one-time event. The role of brAln here underscores an integral part of Wardle's message. **AI is** not a threat to human creativity but **an enabler**. Used properly, "high-tech should enable high-touch," he explains. "AI can handle the routine, freeing us up **to be more imaginative**, more human." Overcoming Obstacles To Teaching Innovation And Creativity Wardle identifies three key challenges to teaching innovation and creativity and offers suggestions for overcoming these challenges. The first obstacle is that too many people believe they are simply not creative. This perspective is based on the misconception that creativity is an innate gift rather than a skill that can be developed. *The Imagination Emporium* offers structured exercises that help cultivate creativity, making it enjoyable and **accessible to students**. The second obstacle is more systematic: the lack of time available in workplaces and schools. Traditional structures, whether classroom or corporate, leave little time for unstructured thinking. **This is where brAln comes in with micro-learning moments. These are short, AI-powered creativity exercises that can naturally fill gaps during the day.** They can be done on the spur of the moment without detailed preparation, but as students work through the material, they will receive a regular dose of instruction. The third obstacle is a combination of fear of failure and rigid thinking. As students age and graduates enter their careers, people tend to avoid risks, and organizations often become risk-averse, both of which hinder innovation. **Wardle offers a solution to this challenge with the "Greenhouse Model," a safe space for nurturing ideas before they are evaluated. The greenhouse emphasizes playfulness and humor as essential elements in unlocking creativity. Combining this model with the brAln tool and the structured exercises from The Imagination Emporium provides educators and learners with a rich set of resources for fostering creativity and innovation.** Why Teaching Innovation And Creativity Matters Now As **AI** continues to advance, Wardle views it as enhancing the value of uniquely human skills like creativity and innovation rather than obviating the need for human creativity. **The Imagination Emporium systematically teaches these skills, making creativity training**

accessible to individuals, schools, and businesses alike. Ultimately, Wardle's work reinforces a crucial idea: innovation is not just for entrepreneurs or artists but for everyone. With the right tools, anyone can learn to think more creatively, solve problems more effectively, and contribute new ideas in any field. If we prepare people to be creative innovators, we can ensure they will have a place in the future, whatever it may hold.

Innovation is key to the economy.

McKinney, Phil. "Innovation Fuels 50% of GDP Growth per Economists." The Innovators Network, **2023**. <https://theinnovators.network/innovation-fuels-50-of-gdp-growth-per-economists/#:~:text=The%20resu> [It%20is%20that%20economists,crucial%20factor%20for%20economic%20growth](https://theinnovators.network/innovation-fuels-50-of-gdp-growth-per-economists/#:~:text=The%20resu). [Fast Company and Businessweek named these teams as being among the "50 Most Innovative". As host of the award-winning podcast, Killer Innovations, he shares his insights on creativity and innovation to help listeners develop their ideas into actionable plans for success. Launched in 2005, the podcast is the longest continuously produced podcast in history. In 2011, Phil authored Beyond The Obvious – a book on innovation and creativity. The book is available in hardcover, digital, and audio.] //arrguy

The role of innovation in economic growth has become increasingly important. Innovation is essential for a healthy and thriving economy **because it increases productivity**, boosts consumer confidence and spending, generates increased profits for businesses, and creates new jobs. The result is that economists have calculated that approximately **50% of annual GDP growth is attributed to innovation**. It's no secret that innovation is a crucial factor for economic growth. According to the Organization for Economic Co-Operation and Development (OECD), nations with environments conducive to innovation witness higher GDP growth rates than their peers who lack these conditions. By fostering innovation, we can create entirely new industries and revenue streams. The internet is a prime example of this: it has completely transformed how we conduct business and opened up a world of opportunity in terms of markets for goods and services.

It is the lynchpin to crisis recovery.

Bristow, Gillian, and Adrian Healy. "Innovation and Regional Economic Resilience: An Exploratory Analysis." The Annals of Regional Science 60, no. 2 (July 26, **2017**): 265–84. <https://doi.org/10.1007/s00168-017-0841-6>. . [Legal Practitioner Director at Bristow Legal who studied at The university of Queensland] //arrguy

The varying rates of recovery of European regional economies from the 2007 to 2008 economic crisis have raised interesting questions about the sources of economic resilience. Policy discourse has increasingly asserted the role played by innovation in facilitating rapid recovery from economic shocks, whilst evolutionary thinking has highlighted the specific importance of innovation capacity. However, empirical evidence on this is lacking. This paper addresses this gap by providing new empirical analysis of the relationship between regional innovation capacity and the resilience of European regions to the crisis. It finds that **regions identified as Innovation Leaders** at the time of the crisis **were significantly more likely to** have either **resisted the [08] crisis** or recovered quickly from it (i.e. within 3 years). This provides important insights for evolutionary approaches theorizing the relationship between innovation and resilience.

Siobhan **Wilson** March 24, 20**23** 'Lack of innovation: a major risk in global recession' <https://www.business-reporter.co.uk/improving-business-performance/lack-of-innovation-a-major-risk-in-global-recession> [Senior Vice President and UK country leader at Oracle] //noush

Business executives are navigating a world of increasing economic volatility, trade and supply chain disruption, and geopolitical conflict. The current economic downturn is pushing many business leaders to reconsider their growth and investment plans and turn their attention to

shoring up their bottom lines. Many may defer riskier decisions and longer-term initiatives in favour of stability. But let's keep in mind some of the lessons we've learned these last few years. While a public health crisis and economic uncertainty have taken their toll, we've seen how building digital connections between businesses and their customers, employees, suppliers and partners remains critical to sustaining innovation, resilience and growth. Quickly cutting one's losses may seem like the easiest route out of a tricky situation, but having the right foundations that nurture and encourage innovation is key to achieving long-term success. Sustainable growth. Organisations burdened by the past three years of upheaval have found little respite from volatility. However, the most resilient have invested in the technologies and digital solutions needed to emerge stronger than before. For instance, 84% of CEOs believe that **innovation is critical to growth**, as they **find new and creative ways to make the most of their resources and invest in better ways of working**. As we face another period of careful spend, organisations mustn't shy away from innovation. Technology plays a key role in the UK's future, unlocking growth potential across all sectors. Organisations must look at how best they can adapt to the economic headwinds, and which areas they are going to prioritise IT spend in to help them on this journey. Organisations should be agile and future-focused **in** their decision-making. A key question they should be asking themselves is whether this IT investment will make a difference when **businesses emerge from the economic crisis**. Thinking beyond the next six months is critical for businesses if they want to create sustainable growth. Innovating faster. During these times, **it's crucial that innovation speeds up**, not slows down. It's the red thread running through a successful business. Customer expectations are incredibly high and they will continue to evolve. Organisations must ensure that new products and services are aligned with their needs more than ever, and developed in a timely and effective manner ahead of the competition. Investing in technology like the cloud, which can scale services according to customer and market demand, is key to this. HSBC, for example, is deploying Oracle Cloud Infrastructure to support and scale its mission critical services, while meeting data locality and security regulations. This is just one example of how organisations are speeding up the development, delivery and scale of new products and services, while ensuring the operational agility needed to grow and diversify. In hospitality, a sector hit hard by the cost-of-living crisis, resilience has also been underpinned by innovation. To meet customer expectations amid massive business disruption during the pandemic, Center Parcs holiday villages implemented an AI-backed digital assistant to manage surges in demand. This automated support handles 65% of web chat traffic and has helped reduce customer wait times from three to five minutes, while providing new insights into guest pain points. This has been **key in helping the company continue to make enhancements, as well as maintain a high level of customer satisfaction**. It's about identifying roadblocks to success, as well as innovative technologies that can mitigate them. The road to recovery. Businesses now understand how investment in new technologies such as cloud and AI opens the door to new capabilities, and can harness business data at scale. This effective use of data is the optimal route towards increased operational efficiency, as well as product innovation and differentiation. Organisations continue to modernise and digitalise not just in spite of current economic realities, but because of them. Despite economic headwinds, market researcher IDC is projecting that IT spending in EMEA is expected to grow 5.2% in 2023, with spend in public cloud set to surpass £14.5bn in the UK. Technology and innovation will continue to play a central role in Britain's recovery and resilience, even in the face of economic turbulence. The route to success is not through being too cautious or timid. It is time for organisations to step up and be bold in their innovation during recovery. **Those who continue to innovate when the chips are down**, able to effectively weigh up decisions in the long term and short term, **will** ultimately **come out stronger**. Organisations that think creatively and embrace innovation will be the ones that **succeed during** these **adverse times**.

And human creativity is an impact filter

Marks 22, Dr. David F. Marks, PhD in Psychology from The University of Sheffield, former Professor and Head of Department of Psychology at the City University of London, "Mental Imagery, Creativity and Planetary Survival", //aashna

The study of imagery and creativity is of special importance. Many of the problems faced by mankind [humankind] involve the use of creative thinking.

In this section I review one representative study indicating the strong links that exist between imagery vividness and creativity. Kobnithikulwong (2007) at the University of Florida, presented her masters thesis on "Creativity and Imagery in Interior Design..." Kobnithikulwong's conceptual framework consisted of a Person, a Process and a Product. The Person needs to have a creative personality and vivid visual imagery. The Process needs to have an Internal Visualization and an External Representation of that visualization which is the Product. Kobnithikulwong designed a drawing and writing task and also measured students' VVIQ and creativity scales. The students were allowed 30 minutes to do a drawing of a "transitional space within a building" and 10 minutes to write a description of being in the space. Significant differences were found between the high and low creative performance students. Low creative performance produced narratives averaging 73 words. High creative performance produced narratives averaging at 133 words, nearly double the length. The low creatives contained linear and rectangular forms that gave the designs a static look. High creatives produced stronger dynamic movement in their designs by using curves and free-form elements. Solutions in the high group employed movement from curves to create perspective "Pulling a viewer into their spaces", while low creatives did not make this kind of connection with the viewer. High creatives showed better quality perspective building techniques and designed spaces which were open on one side or end. Low creatives were mostly enclosed with a more limited perspective. High creatives showed high contrast and line weight while lows produced drawings that were less legible with low line weight and low contrast. Kobnithikulwong (2007) concluded that: "The qualitative analysis indicated that judged creative performance, as an external representation of visualization, positively related to vividness of visual imagery or internal visualization." The correlation between VVIQ score with eyes closed and creativity scores was .31, $p < .02$. Dividing the two groups at the median creativity score gave a significant difference of around 10 points in the VVIQ with eyes closed between the two creativity groups, $p = .006$. However, the scatterplot shows that the relationship is curvilinear and so the use of curvilinear regression (instead of linear) would have yielded a much stronger association. New applications of mental imagery

Applications of mental imagery cross many different fields, including the arts, architecture, design, science, education, sports, IT, policy and planning. Global problems caused by human behaviour such as warming, poverty and over-population may be helped by applying mental imagery in creative ways. Human and planetary survival may ultimately depend upon the effective use of human imagination, including mental imagery.

Advantage three is tech race.

China tech innovation is high, it will surpass the United States---innovation is key.

CDO Times, February 21, 2025 "China Bets Big on AI: The Race Against the US Heats Up – mivalle.net.ar"

<https://cdotimes.com/2025/02/20/china-bets-big-on-ai-the-race-against-the-us-heats-up-mivalle-net-ar/>
[Digital Insights Magazine] //baybay recut noush

A monumental shift echoes through the iconic halls of Beijing as President Xi Jinping gathers China's tech titans under a single, ambitious goal. As global giants like the United States set a relentless pace toward AI supremacy, China's leadership has

amplified its call to arms, rallying private businesses to the frontline of technological innovation Amidst lavish surroundings, Jack

Ma, once a scrutinized figure, and other industry leaders are urged to unleash their potential and steer China toward a

self-reliant future. This dramatic turn in policy marks a departure from past stringent regulations and

highlights the growing necessity for collaboration between the government and private sector—a partnership

critical for China to match and perhaps outpace the US in AI development. The message stands clear: **China's vast market and collaborative environment are** fertile

grounds for **groundbreaking technological advancements**. Faced with external pressures and the American surge toward technological dominance, **China's**

decision-makers understand that private innovation is not just preferred but indispensable. Enter NVIDIA Corporation,

a dominant force in the AI arena. Against this backdrop, it has just released Evo 2, a groundbreaking AI model that offers researchers unprecedented tools to decode the genetic blueprints of life. This leap represents a giant stride in

generative biology, proving critical for future scientific endeavors. **The stage is set for a nexus of innovation** where new **opportunities promise** robust

economic growth and competitive advantage on the world stage. For savvy investors and pioneers alike, this is a call to

seize momentum, riding the powerful wave of AI that reshapes boundaries and defines the future. Strategic

Overview of China's AI Initiative. In a strategic realignment, **China is** harnessing the **capabilities of its tech giants**, notably led by President Xi Jinping, to **foster an**

environment ripe for innovation in artificial intelligence. This shift is particularly focused on creating a self-reliant future by reducing dependency on foreign technology and enhancing domestic capabilities. **Critical to this agenda is the collaboration between the private sector and the**

government, moving away from past stringent regulations. Real-World Use Cases & Industry Impact. **The emphasis on AI isn't just about economic**

growth; it's also about transforming sectors such as healthcare, automotive, and biotechnology For

instance, AI-driven medical diagnostics and autonomous vehicles offer revolutionary possibilities that could redefine these industries. NVIDIA's release of the Evo 2 AI model is a prime example, driving advancements in generative biology that could potentially lead to **breakthroughs in personalized medicine** and genetic research. As researchers gain new tools to decode the genetic blueprints of life, such models are pivotal for scientific progress. Market

Forecasts & Industry Trends: The global AI market is **projected to exceed USD 500 billion by 2025**, with China poised to capture a significant share due to its strategic investments and government backing. By encouraging innovation, **China aims to rival, if not surpass, the US in AI capabilities**, as it solidifies its role as a global tech leader. Pros & Cons Overview: Pros: – Economic Growth: **By advancing AI technologies, China is likely to experience substantial economic growth**. – Technological Advancements: **Enhanced AI applications could lead to breakthroughs across various sectors**. Cons: – Regulatory Challenges: Balancing innovation with security and privacy concerns remains a significant challenge. – Global Tensions: **Heightened competition with Western nations could lead to geopolitical tensions**. Security & Sustainability: AI developments come with concerns regarding data security and the ethical implications of AI usage. Ensuring robust cybersecurity measures and **sustainable practices is crucial in preventing misuse and ensuring the technology's long-term viability**. Reviews & Comparisons: When comparing China and the US's AI strategies, it is evident that both nations are leveraging their unique strengths. The US benefits from a robust entrepreneurial ecosystem and technological infrastructure, while China's centralized approach facilitates rapid policy deployment and resource allocation. Actionable Recommendations 1. Invest in AI Talent: **Companies and educational institutions should prioritize developing AI skills to support the burgeoning sector**. 2. Explore Partnerships: Collaborative **projects between public and private entities can accelerate advancements and open new markets**. 3. Stay Informed: **Keeping abreast of developments in AI technology and policy will enable businesses and investors to pivot strategies effectively**.

The US must win the tech race no matter what---the state is necessary.

Alicia Warren. "US must win AI race as China gains ground: 'Lead is not as big as it once was,' OpenAI exec warns" Jan 14, 2025.

<https://www.foxbusiness.com/media/us-must-win-ai-race-china-gains-ground-lead-big-once-was-openai-exec-warns> [Producer with Fox News Digital and Microsoft News. Alicia Warren writes for Fox Business.]
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OpenAI's Chris Lehane is warning of **America's shrinking lead in the artificial intelligence** space as **the company releases its economic blueprint and policy proposals for the U.S.** During his appearance on "Varney & Co.," Monday, Lehane, OpenAI vice president of global affairs, argued that **the U.S. must** "absolutely" win in the A.I. space, highlighting the key components listed in the company's newly unveiled blueprint. **"We have a lead. That lead is not as big as it once was versus China,"** he said. On Monday, OpenAI publicized its A.I. in America: OpenAI's Economic Blueprint, which focuses on A.I. in national security, **the state's "vital role" in a "maximizing A.I."s** benefits from the start" and infrastructure. FOX NEWS AI NEWSLETTER: TECH LEADERS' MESSAGE TO BIDEN Lehane explained that the blueprint will not only help secure America's lead in the race but also support the "economic opportunity that a country can get" from technology. **"At the federal government level, can we have clear guidance, a coherent strategy when it comes to national security?"** he posited. He went on to add how **the country can leverage A.I.** in order to lead at the state level. **"States can be laboratories of democracy to really lean in and benefit from what this technology** can do," Lehane said. OPENAI REVEALS AI POLICY PROPOSALS TO BEST CHINA, PROTECT KIDS: 'THIS IS A RACE AMERICA CAN AND MUST WIN'. **"There's a lot of conversations about how we grow talent in this country. States can really play a significant role** in that," he expressed. Finally, **the last piece listed in the blueprint is infrastructure. "People have said infrastructure is destiny. We need chips. We need data. We need energy,"** he stressed. **"We're at a moment now, given the race that we're at, which we absolutely have to win,** I do believe we will win. But **to guarantee that we win, we need to think big, we need to act big,** and we need to build big. This country has done that before," Lehane said. As the **U.S. prepares for new leadership,** Lehane expressed **excitement** about potentially **working with** President-elect Trump. "President-elect **Trump has made [it] really clear his perspective on A.I. It is to make sure that America wins** on the national security piece and wins on the economic competitive piece," he explained. **"We**

understand as the premier innovator in this space, that we need to be part of that and have made clear that we want to be supportive of reaching his goals," he said.

Trump will expand AI in education---it calls on public-private sector cooperation AND investment which solves!

Boser 24 Boser, Ulrich. 2024. "Why an AI-Forward Education Agenda Is Possible under Trump." Forbes. November 18, 2024.

<https://www.forbes.com/sites/ulrichboser/2024/11/18/why-an-ai-forward-education-agenda-is-possible-under-trump/>. [Boser is the CEO of The Learning Agency, a mission-driven, education consulting firm. He has been an advisor to many universities, foundations, and companies. His research and writing have appeared on the front page of USA Today and The Tonight Show.] //baybay recut eshn

And, yet, I believe there is still good reason to think an innovative federal education agenda is possible. In particular, innovation advocates should be hopeful that Trump's administration will likely increase investment in artificial intelligence (AI), and there should be strong opportunities to leverage those AI dollars on education projects. There will also be more opportunities for public-private partnership with the new administration in ways that can benefit students and teachers. To be sure, the overall news is grim. Throughout his campaigns, candidate Trump pledged to shut down the U.S. Department of Education, and with Republicans taking control in both the House and Senate, many federal education programs are at risk of deep cuts. Also expect major hard policy shifts on diverse issues from school choice to civil rights. But amidst all the valid concerns, Trump's second term as president will likely offer an opportunity for an education innovation agenda, leaning into the promise of AI. A federal investment at the intersection of AI and education could lead to the development of groundbreaking new tools and approaches that both increase teachers' capacity and improve student outcomes. The Trump administration might not call it an "education agenda," but a look at Trump's previous policy priorities show that such an AI education agenda is quite possible. During his first administration, Trump repeatedly argued that he wanted to double AI spending. He also held an AI summit and called for increased investments in programs such as the National Science Foundation's National AI Research Institutes. In a June interview, Trump described AI as a "superpower" and promised less AI regulations. This pro-AI position will likely continue, given the headlines around AI and China. Plus, Trump's first term was before the advent of ChatGPT.

GenAI requires large swaths of data and training which educational institutions train.

Lederman '24 [Doug Lederman; 4-19-2024; "Data consortium aims for colleges to "own" their AI future"; Inside Higher Ed | Higher Education **News**, Events and Jobs;

<https://www.insidehighered.com/news/tech-innovation/artificial-intelligence/2024/04/19/data-consortium-aims-colleges-own-their-ai>] (brackets og) // tnyl

In an era of generative artificial intelligence (AI), data is king. The large language models on which AI tools are built depend on enormous volumes of data, training and managing AI tools requires powerful (and often expensive) computing power, and major tech providers are far ahead of everyone else in driving AI forward. That creates potential threats for everyone else. A group of higher education leaders are joining forces to try to make sure colleges and universities—especially under-resourced ones—aren't left behind as generative artificial intelligence transforms our work and our lives. The American Council on Education (ACE) is leading the effort to establish the Global Data Consortium, through which participating colleges, nonprofit groups and others around the world would contribute institution-level datasets on learners to create an enormous body of information. Researchers, institutional

leaders and, potentially, companies could tap into the consortium to build AI products and develop their understanding of what works (and doesn't) in the student journey. "The way higher education shapes its own future is by owning our data," said Ted Mitchell, ACE's president. Officials at ACE and its partners emphasized that the envisioned technology that would be used to build the network (which involves the use of "synthetic datasets"—artificial constructs engineered to mimic the statistical properties of real-world data without compromising individual privacy—and "meshing") would allow participants to glean insights from the data without actually giving them access to the underlying student information, which would remain firmly under the control of the participating colleges. Paul LeBlanc, the departing president of Southern New Hampshire University who is focusing on artificial intelligence in the next act of his career, said that enough major institutions, governments and others have committed to the project that the database would already "have data on 35 million students the day we turn it on." "We seem to be overcoming the idea that your data is your [institution's] competitive advantage," LeBlanc said. "Right now we are having to be very reactive—what is Open AI making, how might we use that?" Collaborating, he added, is higher education's best chance to "own our own future" rather than let Google, Meta, Amazon and other major technology powers control the AI landscape. This is especially important, said Scott Durand, a former Southern New Hampshire official who is overseeing the project for ACE, for "small and under-resourced institutions that would have the hardest time playing in the AI game." Major universities like Arizona State and the University of Michigan have struck agreements to collaborate with Open AI, and other major universities are creating their own AI tools, but not all institutions have the resources to do that well. Colleges that don't have significant institutional research offices could glean insights into how their own student bodies compare to learners at other institutions and benefit from AI tools the consortium's members develop together. Durand also said the consortium envisioned providing technical support to needier colleges and universities. College officials briefed on the project expressed excitement but acknowledged potential hurdles. Dan Greenstein, chancellor of the Pennsylvania State System of Higher Education, saw the potential for an "accelerated pace of innovation" through this sort of data-sharing and collaboration. "We may be able to help people avoid going down blind alleys or replicating work others have already done," he said. But he emphasized that participating institutions would have to meet a high bar for ensuring the quality of the data they contribute and to agree to abide by the restrictions the consortium sets on how the data are used. "Membership has certain obligations," he said. "Data will be shared on a solution-oriented basis," states a technical white paper about the project co-written by George Siemens, professor and director of the Centre for Change and Complexity in Learning at the University of South Australia. "This means that data is shared as it relates to a consortia project or to a particular capability that members want to realize. This ensures that data made available addresses a clear need, rather than sharing for the sake of sharing." The consortium is in discussions with leading foundations about initial funding, and the effort could ultimately be funded through membership fees, fees for access to the data or other methods.

Ai leads to more r&D

Gaurav **Sett** 'How AI Can Automate AI Research and Development' Oct 24, 20**24**

<https://www.rand.org/pubs/commentary/2024/10/how-ai-can-automate-ai-research-and-development.html> [Gaurav Sett is a Ph.D. student at the Pardee RAND Graduate School. Previously, he was a fellow at RAND's Technology and Security Policy Center. His research interests include artificial intelligence and national security. Prior to joining RAND, Gaurav received a B.S. and an M.S. in computer science from the Georgia Institute of Technology. He has interned at the Georgia Tech Research Institute, Federal Reserve Board, and the Washington Post.] //aashna

Technology companies are using AI itself to accelerate research and development (**R&D**) for the next generation of AI models, a trend that could lead to runaway technological progress. Policymakers and the public should be paying close attention to AI R&D automation to prepare for how AI could transform the future. Under intensifying competition to improve the capabilities of new AI products, companies that can accelerate AI R&D have the best shot at capturing the growing AI market. Last month, OpenAI released a preview of o1, an AI model that achieved a significant advancement in reasoning. Notably, OpenAI indicated that o1 models can ace the coding interview the company gives to prospective research engineers, the people responsible for designing and implementing AI itself.

R&D is k2 strengthening innovation in a China tech-race – disincentivized innovation is the last thing we need!

Atkinson '25 [Robert D. Atkinson; 2-25-2025; "Winning the Innovation Race: Three Key Policies to Secure US Tech Leadership Over China"; No Publication;
<https://itif.org/publications/2025/02/25/winning-innovation-race-three-key-policies-to-secure-tech-leadership-over-china/>] //baybay recut tnyl

The techno-economic competition with China is the West's most pressing challenge. China is rapidly emerging as a leading innovator in advanced industries and has already pulled ahead in some areas. Given the magnitude of this challenge and weaknesses across the U.S. policy and institutional landscape, smart technology policies are essential to maintaining competitiveness across a broad range of advanced industries. As Robert Atkinson writes in The National Interest, the United States must pursue three critical technology policies to compete effectively with China: Supercharge innovation by strengthening R&D incentives. Congress should restore first-year expensing for research and development and double the R&D tax credit, a proven tool that boosts business R&D and influences where companies conduct it. Considering the U.S. credit is anemic, Congress should increase the regular R&D tax credit to 40 percent and the Alternative Simplified Credit to 28 percent to stay competitive. Defend market share by combatting China's predatory trade practices. Congress should reform Section 337 of the 1930 Tariff Act to make it easier for the U.S. International Trade Commission to issue ten-year exclusion orders on Chinese goods and services tied to unfair practices like IP theft, closed markets, or massive subsidies. Without action, China's mercantilist tactics will erode U.S. market share in key industries and threaten America's innovation lead. Coordinate a national strategy by establishing a National Competitiveness Council. The Trump administration should establish a National Competitiveness Council (NCC) to formulate and coordinate advanced industry competitiveness policy across the federal enterprise. No one in the White House is solely focused on America's innovation, productivity, and competitiveness challenges. Staffed with firm, industry, and technology dynamics experts, the NCC would assess U.S. advanced industry capabilities and guide policies to ensure the United States wins the techno-economic war with China.

The window is closing.

Buchaniec-22 [Catherine Buchaniec, 9-13-2022, "US approaching 'critical time' in tech race with China," C4 Isrnet.

<https://www.c4isrnet.com/artificial-intelligence/2022/09/13/us-approaching-critical-time-in-tech-race-with-china-report-says/>] [education from northwestern university] //baybay recut doobz

The nearly **200-page assessment**, called the "Mid-Decade Challenges to National Competitiveness," is the first published by the Special Competitive Studies Project, a private group led by Eric Schmidt, former Google CEO and co-chairman of the U.S government's National Security Commission on Artificial Intelligence, and Work, who serves on the group's board of advisors. The organization seeks to build on the work completed by the congressionally mandated AI commission, which identified technology as the central element of the rivalry between the U.S. and China. The commission wrapped up its work last October. According to the report, the years 2025 to 2030 will prove critical in deciding whether the U.S. keeps pace or falls behind in the technology battle. Losing the competition could comprise Americans' daily lives, the report said. Not only could China use its techno-economic advantage for political leverage, but Chinese domination could threaten free access to the internet and create a dependence on the country for most core digital technologies, making nations vulnerable to cyber attacks. "Up to this point, because of the 20 years we spent in the Middle East, it kind of took our eyes off the ball," Work said. "As this technological rivalry and competition was really growing in strength, we didn't really respond as we normally have done in the past." Three technology battlegrounds — microelectronics, fifth-generation wireless technology (5G), and AI — tell the story of the U.S. and its allies coming perilously close to ceding the strategic technology landscape, the report said. Those technologies

represent the critical hardware, network infrastructure and software underpinning everyday life in the U.S. as well as the country's national security apparatus.

The US can't afford to lose.

Kroenig-19 (Matthew Kroenig, 11-12-2019, "Will disruptive technology cause nuclear war?" The Bulletin.

<https://thebulletin.org/2018/11/will-disruptive-technology-cause-nuclear-war/> [Dr. Matthew Kroenig is vice president and senior director of the Atlantic Council's Scowcroft Center for Strategy and Security, a tenured full professor of government and foreign service at Georgetown University, a commissioner on the U.S Congress Commission on the Strategic Posture of the United States, and a columnist at Foreign Policy.]//doobz)

For more than 70 years, the world has avoided major power conflict, and many attribute this era of peace to nuclear weapons. In situations of mutually assured destruction (MAD), neither side has an incentive to start a conflict because doing so will only result in its own annihilation. The key to this model of deterrence is the maintenance of secure second-strike capabilities—the ability to absorb an enemy nuclear attack and respond with a devastating counterattack. Recently analysts have begun to worry, however, that new strategic military technologies may make it possible for a state to conduct a successful first strike on an enemy. For example, Chinese colleagues have complained to me in Track II dialogues that the United States may decide to launch a sophisticated cyberattack against Chinese nuclear command and control, essentially turning off China's nuclear forces. Then, Washington will follow up with a massive strike with conventional cruise and hypersonic missiles to destroy China's nuclear weapons. Finally, if any Chinese forces happen to survive, the United States can simply mop up China's ragged retaliatory strike with advanced missile defenses. China will be disarmed and US nuclear weapons will still be sitting on the shelf, untouched. If the United States, or any other state acquires such a first-strike capability, then the logic of MAD would be undermined. Washington may be tempted to launch a nuclear first strike. Or China may choose instead to use its nuclear weapons early in a conflict before they can be wiped out—the so-called "use 'em or lose 'em" problem. According to this logic, therefore, the appropriate policy response would be to ban outright or control any new weapon systems that might threaten second-strike capabilities. This way of thinking about new technology and stability, however, is open to question. Would any US president truly decide to launch a massive, bolt-out-of-the-blue nuclear attack because he or she thought s/he could get away with it? And why does it make sense for the country in the inferior position, in this case China, to intentionally start a nuclear war that it will almost certainly lose? More important, this conceptualization of how new technology affects stability is too narrow, focused exclusively on how new military technologies might be used against nuclear forces directly. Rather, we should think more broadly about how new technology might affect global politics, and, for this, it is helpful to turn to scholarly international relations theory. The dominant theory of the causes of war in the academy is the "bargaining model of war." This theory identifies rapid shifts in the balance of power as a primary cause of conflict. International politics often presents states with conflicts that they can settle through peaceful bargaining, but when bargaining breaks down, war results. Shifts in the balance of power are problematic because they undermine effective bargaining. After all, why agree to a deal today if your bargaining position will be stronger tomorrow? And, a clear understanding of the military balance of power can contribute to peace. (Why start a war you are likely to lose?) But shifts in the balance of power muddy understanding of which states have the advantage. You may see where this is going. New technologies threaten to create potentially destabilizing shifts in the balance of power. For decades, stability in Europe and Asia has been supported by US military power. In recent years, however, the balance of power in Asia has begun to shift, as China has increased its military capabilities. Already, Beijing has become more assertive in the region, claiming contested territory in the South China Sea. And the results of Russia's military modernization have been on full display in its ongoing intervention in Ukraine. Moreover, China may have the lead over the United States in emerging technologies that could be decisive for the future of military acquisitions and warfare, including 3D printing, hypersonic missiles, quantum computing, 5G wireless connectivity, and artificial intelligence (AI). And Russian President Vladimir Putin is building new unmanned vehicles while ominously declaring, "Whoever leads in AI will rule the world." If China or Russia are able to incorporate new technologies into their militaries before the United States, then this could lead to the kind of rapid shift in the balance of power that often causes war. If Beijing believes emerging technologies provide it with a newfound, local military advantage over the United States, for example, it may be more willing than previously to initiate conflict over Taiwan. And if Putin thinks new tech has strengthened his hand, he may be more tempted to launch a Ukraine-style invasion of a NATO member. Either scenario could bring these nuclear powers into direct conflict with the United States, and once nuclear armed states are at war, there is an inherent risk of nuclear conflict through limited nuclear war strategies, nuclear brinkmanship, or simple accident or inadvertent escalation. This framing of the problem leads to a different set of policy implications. The concern is not simply technologies that threaten to undermine

nuclear second-strike capabilities directly, but, rather, any technologies that can result in a meaningful shift in the broader balance of power. And the solution is not to preserve second-strike capabilities, but to preserve prevailing power balances more broadly. When it comes to new technology, this means that the United States should seek to maintain an innovation edge. Washington should also work with other states, including its nuclear-armed rivals, to develop a new set of arms control and nonproliferation agreements and export controls to deny these newer and potentially destabilizing technologies to potentially hostile states. These are no easy tasks, but the consequences of Washington losing the race for technological superiority to its autocratic challengers just might mean nuclear Armageddon.

Extinction!

Sargoytchev 8. (Dr. Stoyan Sargoytchev, Engineering Diploma, PhD in Physics in the Field of Space Research, Worked with European Space Agency, Worked with the Program Intercosmos Coordinated by the Former Soviet Union, Visiting Scientist @ Cornell Univ, Worked in Arecibo Observatory, Currently Works with the Canadian Space Agency, and York University, Editor in Chief. "MANIFESTO: Prevent Nuclear Disaster – Doomsday" Paper Prepared by International Group of Scientists and Engineers] //baybay

Recent research by an international group of scientists reveals a possible unintended global consequence of the preemptive nuclear strike policy adopted by the major nuclear powers. In the worst case of simultaneous atmospheric nuclear explosions a part of Earth's atmosphere could be lost. Laboratory experiments on EM-activated plasma around a solid object led to the discovery of an antigravity effect called Stimulated Anomalous Reaction to Gravity (SARG). Analysis of atmospheric nuclear explosion data revealed that a similar but large-scale effect is involved in the formation of the nuclear mushroom often accompanied by multiple tornados. If two or more nuclear explosions were to occur close together in space and time, the observed effect could trigger a huge space tornado. Similar phenomena observed on the sun are responsible for ejecting enormous quantities of gaseous mass into space. Such a tornado on Earth could also fling part of our atmosphere into space. The resulting decrease in atmospheric pressure could lead to extinction of life on Earth.

2AC

On c1 of climate

Top off - not a single piece of ev that states education searches and prompts fuel the water crisis - at that point, theres no link into the topic because its specific to generative ai use in education

[DL] - Generative AI is only responsible for a fraction of all emissions.

Kemene, Eleni, et al [*Lead of Industry Decarbonization and Chemicals Sector @ World Economic Forum*]. "AI and Energy: Will AI Reduce Emissions or Increase Demand?" *World Economic Forum*, 22 July 2024, www.weforum.org/stories/2024/07/generative-ai-energy-emissions/. Accessed 5 Mar. 2025. //JZ

How much energy does AI use? Ask ChatGPT and this is what it says: "AI systems vary widely in energy consumption depending on their complexity and usage, but they generally require significant amounts of electricity to process and analyse data efficiently." That response required around ten times the electricity of a Google search, by some estimates. And with 100 million users of ChatGPT every week, the extra energy demand starts to add up. And that's just users on one platform. Across the industry, the increasing energy demand, primarily from building and running the data centres used to train and operate AI models, is contributing to global greenhouse gas (GHG) emissions. Microsoft, which has invested in ChatGPT maker OpenAI and has positioned generative AI tools at the heart of its product offering, recently announced its CO2 emissions had risen nearly 30% since 2020 due to data centre expansion. Google's GHG emissions in 2023 were almost 50% higher than in 2019, largely due to the energy demand tied to data centres. So while AI tools promise to help the energy transition, they also require significant computing power. AI's energy use currently only represents a fraction of the technology sector's

power consumption, which is estimated to be around 2-3% of total global emissions. This is likely to change as more companies, governments and organizations use AI to drive efficiency and productivity. Data centres are already significant drivers of electricity demand growth in many regions, as this chart shows. AI requires significant computing power, and generative AI systems might already use around 33 times more energy to complete a task than task-specific software would. As these systems gain traction and further develop, training and running the models will drive an exponential increase in the number of data centres needed globally – and associated energy use. This will put increasing pressure on already strained electrical grids. Training generative AI, in particular, is extremely energy intensive and consumes much more electricity than traditional data-centre activities. As one AI researcher said, "When you deploy AI models, you have to have them always on. ChatGPT is never off." The growth in sophistication of a large language model, such as the one on which ChatGPT is built, illustrates this escalating demand for energy. Training a model such as Generative Pre-trained Transformer 3 (or GPT-3) is estimated to use just under 1,300 megawatt hours (MWh) of electricity. This is roughly equivalent to the annual power consumption of 130 homes in the US. Training the more advanced GPT-4, meanwhile, is estimated to have used 50 times more electricity. Overall, the computational power needed for sustaining AI's growth is doubling roughly every 100 days. This leaves society wrestling with some thorny questions. Do the economic and societal benefits of AI outweigh the environmental cost of using it? And more specifically, do the benefits of AI for the energy transition outweigh its increased energy consumption? Finding the sweet spot between challenges and opportunities will be key to getting the answers we need. Reports predict that AI has the potential to help mitigate 5-10% of global GHG

emissions by 2030. So what needs to happen to strike the right balance? Regulators including the European Parliament are beginning to establish requirements for systems to be designed with the capability of logging their energy consumption. And advances in technology could help address AI's energy demand, with more advanced hardware and processing power expected to improve the efficiency of AI workloads. Researchers are designing specialized hardware such as new accelerators, new technologies such as 3D chips, which offer much-improved performance, and new chip cooling techniques. Computer chip

maker **Nvidia** claims its new ‘superchip’ can deliver a 30 times performance improvement when running generative AI services, while **using 25 times less energy. Data centres, too, are becoming more efficient.** And new **cooling technologies** and sites that can **perform more computations** when power is cheaper, more available and more sustainable are being explored to push this **efficiency further**. Alongside this, **reducing overall data usage – including addressing the issue of dark data**, which is data generated and stored but then never used again – **will be important**. And being more selective about how and where AI is used – for example by using small language models, which are less resource intensive, for specific tasks, will also help. Finding a better balance between performance, costs and the carbon footprint of AI workloads will be key. AI is not the only factor applying pressure to the grid. The energy needs of growing populations and trends towards electrification are creating increased demand that could lead to slower decarbonization of the grid. Yet a clean, modern and decarbonized grid will be vital in the broader move to a net-zero emissions economy. Data centre operators are exploring alternative power options, such as nuclear technologies, to power sites or storage technologies such as hydrogen. Companies are also investing in emerging tech such as carbon removal, to suck CO₂ out of the air and store it safely. **AI can have a role in overcoming barriers to integrating the necessary vast amounts of renewable energy into existing grids, too.** The variability in renewable energy production often results in overproduction during peak times and underproduction during lulls, leading to wasteful energy consumption and grid instability. By analyzing vast datasets, from weather patterns to energy consumption trends, **AI can forecast energy production with remarkable accuracy.** This could enable job scheduling and load shifting to make sure data centres use energy when electricity from renewable energy sources is available – ensuring optimal grid stability, efficiency and 24/7 clean power. AI is also helping to **transform the energy efficiency of other carbon-intensive industries, from modelling buildings to predict energy use and optimize the performance of heating and air conditioning to improving the efficiency of manufacturing through predictive maintenance.** In agriculture, sensors and satellite imagery are helping to predict crop yields and manage resources. Balancing AI’s energy use and emissions with its societal benefit takes in many complex, interlinked challenges, and requires a multistakeholder approach. The World Economic Forum’s Artificial Intelligence Governance Alliance is applying a cross-industry and industry-specific lens to understand how AI can be leveraged to transform sectors and drive impact on innovation, sustainability and growth. As part of this initiative, the Forum’s Centre for Energy and Materials and Centre for the Fourth Industrial Revolution are launching a dedicated workstream to explore the energy consumption of AI systems and how AI can be leveraged as an enabler for the energy transition.

[DL] - Generative AI is significantly **better than existing methods of text computation.**

Tomlinson, Bill, et al [*Professor of Informatics and Education @ University of California, Irvine; Researcher @ California Institute for Telecommunications and Information Technology Studying AI, Sustainable ICT, and Human-Computer Interaction; 2008 Sloan Research Fellow; Served on the EPA’s Board of Scientific Counselors, Sustainable and Healthy Communities Subcommittee c. 2014-2017; BA in Biology @ Harvard, M.F.A. in Experimental Animation @ CalArts, and MA and Ph.D. in Media Arts and Sciences @ MIT*]. “The Carbon Emissions of Writing and Illustrating Are Lower for AI than for Humans.” *Scientific Reports*, vol. 14, no. 1, Feb. 2024, p. 3732, <https://doi.org/10.1038/s41598-024-54271-x>. Accessed 5 Mar. 2025.//JZ

As AI systems proliferate, their greenhouse gas emissions are an increasingly important concern for human societies. In this article, we present a comparative analysis of the carbon emissions associated with AI systems (ChatGPT, BLOOM, DALL-E2, Midjourney) and human individuals performing equivalent writing and illustrating tasks. **Our findings reveal that AI systems emit between 130 and 1500 times less CO₂e per page of text generated compared to human writers**, while AI illustration systems emit between **310 and 2900 times less CO₂e per image than their human counterparts**. Emissions analyses do not account for social impacts such as professional displacement, legality, and rebound effects. In addition, AI is not a substitute for all human tasks. Nevertheless, **at present, the use of AI holds the potential to carry out several major activities at much lower emission levels than can humans.** In this section, we present

the results of our numerical analyses, which offer a comparison of the environmental impacts associated with AI systems and human activities in the context of writing and illustration tasks. While it can be difficult to define the scope of the problem when calculating the emissions produced by an AI system⁵, two major components of that impact are the training of the model (a one-time cost that is amortized across many individual queries) and the per-query emissions. To offer two data points on the environmental impact of training models, training GPT-3 (the system on which the popular ChatGPT chatbot is based¹⁷) produces approximately 552 metric tons CO₂e¹¹. Training BLOOM, a model slightly larger and substantially more energy-efficient than GPT-3, produces 50.5 metric tons of CO₂e¹². Apart from the amortized emissions associated with training, each AI system query also contributes to the overall emission footprint. An informal online estimate for ChatGPT indicates that it produces 0.382 g CO₂e per query¹⁸, based on 3.82 metric tons CO₂e per day divided by 10,000,000 queries per day. In comparison, a deployment of BLOOM generated 1.5 g per query (340 kg CO₂e divided by 230,768 queries)¹². Assuming that ChatGPT undergoes a full re-training of the model once per month and continues with an estimated 10,000,000 queries per day, the 552 metric tons divided by 300,000,000 queries equates to 1.84 g CO₂e per query for the amortized training cost. Consequently, the combined impact of training and operation for ChatGPT amounts to approximately 2.2 g CO₂e per query. For BLOOM, assuming a similar level of usage and frequency of retraining as for ChatGPT, the per-query impact of training is 0.10 g CO₂e, while the per-query operational cost is 1.47 g. This results in a total emission of 1.6 g per query for BLOOM. We also calculated the embodied energy of the chips used to train the model and of the server used to deliver the query, and the end-of-life recycling of those devices, but all of these factors were 2–5 orders of magnitude smaller than the training and per-query emissions. The embodied energy footprint of an A100 GPU is 150 kg CO₂e¹². The energy footprint for recycling an equivalent device is 1 kg CO₂e¹⁹. Training BLOOM requires 433 MWh of energy, and training GPT-3 requires 1287 MWh¹². Approximating that a GPU lasts 1.5 years before becoming obsolete²⁰, the amortized training cost per query for BLOOM is 0.00004 g CO₂e, and for GPT-3 is 0.0001 g CO₂e. Similarly, the embodied energy of the server used to conduct the query is approximately 2500 kg CO₂e¹². Since, based on our own measurement, a GPT-3 query takes approximately 3.8 s per page of text (4.4 s for ChatGPT to produce 292 words), the embodied energy of the server per query is 0.03 g CO₂e. These values are several orders of magnitude lower than the energy footprint of training and conducting the query. These figures illustrate that the impact of an AI query, encompassing both amortized training and the query itself, is on the order of a few grams CO₂e. To calculate the carbon emissions associated with human writing, we first examine the writing speed and productivity of human writers. An article in The Writer magazine states that Mark Twain's output, which was roughly 300 words per hour, is representative of the average writing speed among authors²¹. Therefore, we use this writing speed as a baseline for human writing productivity. To calculate the carbon footprint of a person writing, we consider the per capita emissions of individuals in different countries. For instance, the emission footprint of a US resident is approximately 15 metric tons CO₂e per year²², which translates to roughly 1.7 kg CO₂e per hour. Assuming that a person's emissions while writing are consistent with their overall annual impact, we estimate that the carbon footprint for a US resident producing a page of text (250 words) is approximately 1400 g CO₂e. In contrast, a resident of India has an annual impact of 1.9 metric tons²², equating to around 180 g CO₂e per page. In this analysis, we use the US and India as examples of countries with the highest and lowest per capita impact among large countries (over 300 M population). In addition to the carbon footprint of the individual writing, the energy consumption and emissions of the computing devices used during the writing process are also considered. For the time it takes a human to write a page, approximately 0.8 h, the emissions produced by running a computer are significantly higher than those generated by AI systems while writing a page. Assuming an

average power consumption of 75 W for a typical laptop computer²³, the device produces **27 g of CO₂e**²⁴ during the writing period. It is important to note that using green energy providers may reduce the amount of CO₂e emissions resulting from computer usage, and that the EPA's Greenhouse Gas Equivalencies Calculator we used for this conversion simplifies a complex topic. However, for the purpose of comparison to humans, we assume that the EPA calculator captures the relationship adequately. In comparison, a desktop computer consumes 200 W, generating 72 g CO₂e in the same amount of time. Figure 1 compares several variations of authorship: **BLOOM is 1400 times less impactful, per page of text produced, than a US resident writing.** and 180 times less impactful than a resident of India writing. **ChatGPT is 1100 times less impactful than a US resident writing,** and 130 times less impactful than a resident of India writing. Assuming the quality of writing produced by AI is sufficient for whatever task may be at hand, **AI produces less CO₂e per page than a human author** (We note that just the time spent by the human writing the query and waiting for the query to be handled by the server has a far greater footprint than the AI system itself. If a person takes 1 min to write a query, and needs to wait 4 s (0.07 min) for the query to be handled: at 15 metric tons CO₂e per year for a US resident, 1.06 min has a footprint of 30 g CO₂e, approximately **15 times greater than the AI itself.** In addition, we note that there is significant complexity to writing processes: both human- and AI-produced text will likely need to be revised and rewritten based on the human authors' sense for how effectively the text expresses the desired content. Since this revision process exists in both human and AI-assisted writing, we feel it is beyond the scope of this analysis. Future work could assess whether the editing process tends to be more iterative and time-intensive in human writing with or without AI.). Authorship does not exist in a vacuum, and any accounting for the return on energy expenditure is confounded by the impact to the rest of the network in which it is embedded. For example, successful AI deployments may beget more costly models in the future, more frequent prompts by users, or more costly training schedules. On the other hand, human authorship may implicitly be training for other kinds of productive human work that would be lost in the face of the proliferation of AI writing. The freed human time may also incur new unexpected environmental costs.

- a. **Pre-empt "Emissions will increase, as more AI is used": 1] Our evidence is pretty recent and already takes into account the increase in AI usage. 2] You are not sure when this surge of usage will outpace the 1500x reduction AI provides.**

T - Education is key to solving climate change

UN 20 [United Nations, "Education is key to addressing climate change", 07/14/2020, United Nations, <https://www.un.org/en/climatechange/climate-solutions/education-key-addressing-climate-change>] AP

Education is a **critical** agent in addressing the issue of **climate change**. The UN Framework Convention on Climate Change (UNFCCC) assigns responsibility to Parties of the Convention to undertake educational and public awareness campaigns on climate change, and to ensure public participation in programmes and information access on the issue. Education can encourage people to change their attitudes and behavior; it also helps them to make informed decisions. In the classroom, **young people can be taught the impact of global warming and learn how to adapt** to climate change. Education empowers all people, but especially **motivates the young to take action**. Knowing the facts helps eliminate the fear of an issue which is frequently colored by doom and gloom in the public arena. In this context, UNICEF has tapped into the minds and imaginations of children around the world to capture what it means to be a child growing up in the age of rapid climate change.

T - AI helps climate literacy

Carmen 24 [Atkins, Carmen, "Generative AI tools can enhance climate literacy but must be checked for biases and inaccuracies", 04/30/2024, Nature, <https://www.nature.com/articles/s43247-024-01392-w>] AP

In the face of climate change, **climate literacy is becoming increasingly important.** With wide access to generative AI tools, such as OpenAI's ChatGPT, we explore the potential of AI platforms for ordinary citizens asking climate literacy questions. Here, we focus on a global scale and collect responses from ChatGPT (GPT-3.5 and GPT-4) on climate change-related hazard prompts over multiple iterations by utilizing the OpenAI's API and comparing the results with credible hazard risk indices. We find a general sense of agreement in comparisons and consistency in ChatGPT over the iterations. GPT-4 displayed fewer errors than GPT-3.5. **Generative AI tools may be used in**

climate literacy, a timely topic of importance, but must be scrutinized for potential biases and inaccuracies moving forward and considered in a social context. Future work should identify and disseminate best practices for optimal use across various generative AI tools.

T - AI helps with green energy

Johnson 25 [Alex Johnson, "AI and Energy: Creating a Greener, Smarter World", 02/19/2025, TechResearchs - The future of marketing technology research., <https://techresearchs.com/tie-tech/ai-and-energy-sustainability-creating-a-greener-smarter-world/>] AP

AI-Powered Smart Grids The integration of AI and energy management systems is enhancing smart grids by predicting demand, optimizing distribution, and minimizing waste. Traditional power grids struggle with inefficiencies due to outdated infrastructure and unpredictable consumption patterns. AI-driven smart grids use machine learning algorithms to analyze real-time data, enabling grid operators to make informed decisions that improve reliability and reduce energy loss. AI in Renewable Energy Integration AI is playing a crucial role in optimizing the integration of renewable energy sources like solar and wind into the power grid. Since renewable energy sources are often intermittent, AI helps forecast weather conditions, predict energy generation, and balance energy supply and demand effectively. AI-powered storage solutions ensure that excess energy generated from renewables is efficiently stored and distributed when needed, reducing dependency on fossil fuels. AI in Energy Consumption Optimization For industrial and commercial sectors, AI-driven energy optimization solutions analyze usage patterns and suggest measures to reduce waste. AI-powered automation adjusts energy-intensive processes, such as heating, cooling, and lighting, based on real-time demand. These AI-driven systems not only cut costs but also lower carbon footprints, making energy consumption more sustainable. AI-Driven Sustainability Solutions Reducing Carbon Footprint with AI Industries worldwide are adopting AI to monitor energy consumption and minimize carbon emissions. AI algorithms can analyze massive datasets to identify inefficiencies and suggest real-time optimizations. AI-driven automation in manufacturing and transportation sectors helps reduce fuel consumption, lower greenhouse gas emissions, and contribute to sustainability goals. AI in Smart Buildings The use of AI and energy efficiency technologies in smart buildings is transforming urban energy management. AI systems optimize heating, ventilation, air conditioning (HVAC), lighting, and security by analyzing occupancy patterns and environmental conditions. AI-powered smart thermostats adjust temperatures automatically to reduce unnecessary energy consumption, making buildings more energy-efficient and cost-effective. AI in Energy Trading and Grid Balancing AI is also revolutionizing energy trading markets by analyzing supply and demand fluctuations in real-time. AI-powered predictive analytics help energy providers adjust pricing dynamically, optimize resource distribution, and ensure grid stability. This benefits both consumers and utility providers by reducing electricity costs and preventing power outages.

No brink to the arg, every tenth of a degree 1) isnt specific to US 2)

On c2 of academic integrity

Their evidence has an incredibly small sample size. You should reject it because 1] when scaled, it cannot accurately represent the rest of the U.S, 2] the data most likely has high variability, and 3] this means our argument O/W on scope.

[T] - Generative AI can foster critical thinking and improve learning outcomes.

Sloan, Karen [Content Marketing Team @ Carnegie Learning; Mathematics and Social Studies Teacher for 16 Years in Ohio]. "Should Students Use Generative AI? Benefits without Cheating." *Blog | Carnegie Learning*, 12 Oct. 2023, www.carnegielearning.com/blog/is-using-chatgpt-cheating/. Accessed 28 Feb. 2025.//JZ

Cheating among students has always been a problem, and it continues to be a concern as education evolves. With the rise of AI technology, the way cheating happens is also changing. Many schools use one-to-one technology, so students will likely use generative AI tools for schoolwork. So, how can we make sure our students use AI without cheating? Is that even possible? I argue yes; let's examine why and how. Cheating is usually seen as copying answers, sharing information during exams, or plagiarizing from the internet. But the rise of AI-powered tools has muddied the waters. I've talked with colleagues, teachers, and my teenager about using AI to cheat in school. Here's some of what we discussed: *Is asking ChatGPT to write a paper, then turning it in unedited, cheating?* Absolutely. Everyone agrees on this. *Is it cheating to ask generative AI to explain the steps to a math problem you got wrong?* In most cases, no—but some educators have varying feelings. *Is prompting ChatGPT to summarize a novel you were supposed to read for class cheating?* That's a tricky one... There's no doubt that **AI tools like ChatGPT and Google Bard** can be used to cheat, but they **can** also be used to **transform learning**. Generative AI can **help students understand complex concepts, brainstorm ideas, boost creativity and critical thinking, and receive guidance**—all while upholding high standards for academic integrity. Let's dig deeper. Concerns about academic honesty are significant. It is also crucial to recognize that **numerous AI programs can provide valuable creative inspiration**. Take, for example, Google's new TextFX. TextFX is a "set of tools for rappers, writers, and wordsmiths." **It uses AI to help with similes, explore topics from different perspectives, create sensory details for scenes, and more.** Imagine a student facing writer's block on a creative writing assignment. With the click of a button, AI like TextFX can **offer suggestions** that help students explore new angles and tickle ideas in their brains. It serves as a **virtual brainstorming companion, encouraging creativity and pushing the boundaries of imagination**. In this screenshot, TextFX gives a list of sensory details about the writing prompt, "Traveling to outer space." It includes prompts such as, "The taste of freeze-dried space food," and "The smell of ozone, a sharp and acrid odor." Students can use these prompts as a starting point to add more imaginative details to bring their story to life. TextFX is an AI tool that can help students view AI-generated content as a starting point for their creativity. It sparks their creative fire. **Using AI for academic purposes is not cheating.** It is using AI as a partner to help students come up with new ideas and solutions. Beyond helping students discover their inner creativity, **AI can be a valuable catalyst for fostering critical thinking**. For example, a student can submit their writing to ChatGPT. They can ask it to **check for grammar, structure, and clarity in their arguments and expression**. Using AI for these purposes is similar to peer or teacher review. **As students use the feedback, they're actively participating in viewing their work with a critical eye.** **Self-assessment**, in this way, plays a **crucial role in developing critical thinking skills**. Generative AI can take a simple idea and make it more detailed and easier to understand. This encourages students to **think deeply about the core principles and related concepts and consider perspectives outside their own**. I recently went to ChatGPT with a topic that was often heavily discussed in the high school social studies classes I co-taught. I pretended to be a student curious about the Treaty of Versailles and its impact after World War I. I wanted to learn more about it. Here's what happened: In the screenshot, ChatGPT discussed the negative impacts of the Treaty of Versailles on Germany's military, economy, and land. These effects were new to me. These are just a few of the 12 examples it provided. Students should be encouraged to research and fact-check. We all know AI can get it wrong, sometimes! If students use this type of support and adhere to ethical standards that prohibit plagiarism, they won't be caught up in the "Is ChatGPT cheating?" trap. **Similarly, ChatGPT and other AI chatbots can engage students in simulated conversations or debates. This allows them to practice constructing arguments, anticipating counterarguments, and refining their communication skills.** In world language classrooms, **ChatGPT can personalize conversation practice and so much more.** Another handy, yet ethical, use for **AI chatbots** in the classroom? They're great at **assisting students when they need**

help organizing their work. Generative AI can help **organize** ideas into outlines and summaries, and give students ideas to start writing. These features can be a game-changer for students struggling to structure their thoughts or articulate their ideas effectively!

Here, Bard offers ideas to help a student start writing a paragraph about American involvement in the Vietnam War. It gives tips such as, "Start with a question," and "Start with a quote from a historical figure or expert." You might be wondering if it's okay to ask ChatGPT or Bard to help outline your writing. This situation shows why it's important to teach students about using AI ethically. When used properly, AI can help students improve their academic performance without cheating. For example, the student in our story told Bard not to write the paragraph. Generative AI, with its natural language processing capabilities, is great at simplifying complex topics. Students can use AI to simplify complex

information, like a science article for a paper. The AI **breaks it down** into easier explanations, but works best with shorter sections. This process helps break down comprehension barriers, making it easier for students to grasp difficult subject matter. Generative AI can help students understand also help students understand simpler, yet still confusing information. As a high school teacher, I spent a lot of time rewording instructions. I also spent time explaining tasks in different ways and breaking information down into smaller parts. Using generative AI can help students ask for different explanations, saving time for teachers. It also helps students feel more independent and in control. In the new digital age of education, we need to rethink cheating and how AI is involved in education. When used thoughtfully and with guidance, generative AI tools can unlock the full potential of every student—while avoiding traditional notions of cheating. Interested in exploring the ethical considerations of using AI in your classroom? Check out this blog for our top 10 ethical AI practices for K–12 students.

We have a better link on our c2 impact filter. Creatiivt yoslves back for global crises and is key to survival because it allows us to solve issues with creativity.

O/W on Scope: More students use AI to assist with assignment completion than cheat.

Kelly, Rhea [BA in English @ Pomona College; Editor in Chief @ Campus Technology, THE Journal, and Spaces4Learning]. "Survey: 86% of Students Already Use AI in Their Studies." *Campus Technology*, 28 Aug. 2024,

campustechnology.com/Articles/2024/08/28/Survey-86-of-Students-Already-Use-AI-in-Their-Studies.aspx.

Accessed 28 Feb. 2025.//JZ

In a recent survey from the Digital Education Council, a global alliance of universities and industry representatives focused on education innovation, the majority of students (86%) said they use artificial intelligence in their studies. And they are using it regularly: Twenty-four percent reported using AI daily; 54% daily or weekly; and 54% on at least a weekly basis. For its 2024 Global AI Student Survey, the Digital Education Council gathered 3,839 responses from bachelor, masters, and doctorate students across 16 countries. The students represented multiple fields of study. On average, surveyed students use 2.1 AI tools for their courses. ChatGPT remains the most common tool used, cited by 66% of respondents, followed by Grammarly and Microsoft Copilot (each 25%). The most common use cases:

- Search for information (69%);
- Check grammar (42%);
- Summarize documents (33%);
- Paraphrase a document (28%); and
- Create a first draft (24%).

Despite their wide use of AI tools, students were not confident about their AI literacy, the survey found. Fifty-eight percent of students reporting feeling that they do not have sufficient AI knowledge and skills, and 48% felt inadequately prepared for an AI-enabled workforce. Notably, 80% of surveyed students said their university's integration of AI tools (whether that be integration into teaching and learning, student and faculty training, course topics, or other areas) does not fully meet their expectations. Students' top AI expectations included:

- Universities should provide training for both faculty and students on the effective use of AI tools (cited by 73% and 72% of respondents, respectively);
- Universities should offer more courses on AI literacy (72%);
- Universities should involve students in the decision-making process regarding which AI tools are implemented (71%); and
- Universities should increase the use of AI in teaching and learning (59%).

"The rise in AI usage forces institutions to see AI as core infrastructure rather than a tool," commented Alessandro Di Lullo, CEO of the Digital Education Council and Academic Fellow in AI Governance at The University of Hong Kong. At the same time, he said, "universities need to consider how to effectively boost AI literacy to equip both students and academics with the skills to succeed in an AI-driven world."

T - Only the aff solves.

Stratagems 23 [AI Stratagems, "AI Guide to Picking the Best Plagiarism Checker", 02/20/2023, AI Stratagems, <https://aistratagems.com/best-plagiarism-checkers/>]

When it comes to maintaining the quality of content on various websites, blog posts, and other sources, **AI-powered plagiarism checkers are an invaluable resource**. Especially for those who produce a lot of content, having a trustworthy tool that can quickly and accurately scan for any signs of plagiarism is essential. But with so many options on the market, it can be hard to know which one fits your needs best. That's why we've compiled this definitive guide to picking the right AI powered plagiarism checker for you. We'll provide detailed information about each of the most popular solutions to make sure you're equipped with all the necessary knowledge to pick the perfect one. Whether you're looking to ensure the quality of your own work, or check the potential plagiarism of others' content, you'll find exactly what you need in this guide. Common Questions: How Accurate Are Plagiarism Checkers? **Plagiarism checkers are very accurate**, with reported accuracy rates ranging from 75-99%. According to an independent study conducted by **Turnitin**, a leading plagiarism checker, their **software has been found to have an accuracy rate of 97%**. Other sources such as Plagiarism.org and Grammarly report accuracy rates ranging from 78-91%. In addition to the accuracy of these checkers, it's important to note that they do not detect all instances of plagiarism. Because of this, it's important to use other methods such as manual review to ensure that content is original.

On c3 of finances

- UQ thumps, enrollment is at a high

Knox, Liam. 20**25**. [Liam Knox covers admissions and enrollment for Inside Higher Ed and writes the Admissions Weekly newsletter. Before joining IHE in 2022 he worked for NPR's On Point, WBUR, NBC News Digital, MuckRock, and as an intern at The Chronicle of Higher Education. In 2019 he graduated from Tufts University, where he studied history and was the founding investigations editor of The Tufts Daily.] "Enrollment Passes Pre-Pandemic Levels with First-Year Surge." Inside Higher Ed | Higher Education News, Events and Jobs. 2025. <https://www.insidehighered.com/news/admissions/traditional-age/2025/01/23/enrollment-passes-pre-pandemic-levels-first-year-surge#:~:text=A%20Stunning%20Enrollment%20Surge,from%20an%20erroneous%20earlier%20report.&text=Enrollments%20got%20a%20big%20boost,findings%20of%20a%20preliminary%20report.&text=Postsecondary%20enrollment%20is%20up%204.5,demographic%20challenges%20across%20the%20country.//jenna>
Postsecondary enrollment is up 4.5 percent this year, bringing the combined number of undergraduate and graduate students **above 2019 numbers for the first time since the COVID-19 pandemic**, according to a new report from the National Student Clearinghouse Research Center. Undergraduate enrollment rose by 4.7 percent, though it remains 1 percent below 2019 levels. First-year undergraduate enrollment slightly surpassed pre-pandemic levels for the first time, rising by 5.5 percent.

- **Empirics prove,**

Barron 23 [Barron, James. worked for The Times since a week after I graduated from college. I spent a year in the bureau in Albany, N.Y., and two as a national correspondent in Detroit. I wrote the moment-to-moment stories about the Sept. 11 attacks for NYTimes.com in 2001 and the lead stories on the Northeast blackout in 2003, Hurricane Irene in 2011 and Hurricane Sandy in 2012. I wrote the Coronavirus Update column for the print newspaper from 2020-21. "How A.I. Increased the Graduation Rate at John Jay College by 32 Points." The New York Times, 20 Sept. 2023, www.nytimes.com/2023/09/20/nvregion/ai-john-jay-college.html.] //rishtish

Dara Byrne was so surprised by the numbers on graduation rates that she triple-checked them. In two years, **the graduation rate** among students **at John Jay College** with enough credits to get their diplomas after one more year of study had **jumped 32 percentage points, to 86 percent**. "It was jaw-dropping," she said. Byrne, then the associate provost, **credits artificial intelligence — specifically, A.I.-powered software that analyzed things like whether students' grades were slipping and whether they had signed up for courses that would give them enough credit hours to graduate.** The software **generated a "risk score" for every student that told academic advisers which students to concentrate on.** "It can be hard to know who requires a little more attention," said Dana Prieto, one of two academic advisers at John Jay, who explained that students with risk scores that pointed to a chance of dropping out were given extra help, including one-on-one coaching. Byrne said the **A.I. software helped identify roughly 200 students who could benefit most. She was also clear about what the software cannot do: "The A.I. cannot tell us about the student experience and cannot present strategies," she said.** "That's still always going to be the role of the academic advisers."

- **Alt reasons to low funding: their own ev cites: flattening enrollment prospects, and a great deal of policy uncertainty, low ratings for those same colleges**

- **It doesn't say AI spending is the reason it just says it's expensive**
- **But aff can solve bc**
 - if ai is in education then we can teach kids how to use it at a time when the future workforce requires a mastery over AI.
 - 4000% ROI

Heart 24 [Heart, Erin. 2024. "The Potential ROI of AI Chatbot in Higher Education." Verge AI - AI-Powered Student Engagement Platform. April 2, 2024.

<https://verge-ai.com/blog/the-potential-roi-of-ai-chatbot-in-higher-education/>.] [Erin Heart - Sales and Marketing Coordinator - Verge AI Cape Town, Western Cape, South Africa · Sales and Marketing Coordinator · Verge AI My role involves working closely with our team to develop AI-driven solutions that meet the evolving needs of higher education institutions.] // Jaival

The Cost of an AI Chatbot Firstly, we need to consider the cost of implementing an AI chatbot. In most cases, there will be a fee to implement the chatbot, and then some form of ongoing licensing costs to maintain its usage. **In this case, we have assumed an implementation fee of \$30,000 and yearly licensing costs amounting to \$60,000. For a more conservative**

prediction, let's assume that the university will also pay a monthly maintenance cost of \$500. This brings the total cost of the AI chatbot to the university up to \$96,000 for an entire year. (Interestingly, this number will be lower in years to follow, since the implementation fee is usually a one-off cost).

Quantifying the Benefits of an AI Chatbot Now that we have a rough idea of the costs involved, next, we will look at how much this tech will save the university. For this situation, we will exclusively be looking at the ROI for a chatbot that only helps students. We have made some conservative assumptions to make sure that the predicted ROI is more realistic. **Staffing Costs** Since the AI chatbot will be capable of answering a range of questions much more quickly than a human can, universities will be able to optimize their workforce. If it aligns with the university's strategic goals and operational needs, this technology could potentially mean they'd need two fewer people at the helpdesk. If we assume that each of these staff members earns \$2,500 per month, that's about \$60,000 saved per year. Of course, there's another angle to consider. Instead of letting those employees go, the university could choose to repurpose them. Instead of manning the helpdesk, they could tackle more intricate student support tasks that the chatbot isn't quite equipped to handle. Assuming the chatbot saves an average of 3 minutes per inquiry and handles 100 inquiries per day, if the average hourly rate for staff is \$15, the potential savings would be \$1,500 per month (\$75 per day * 20 working days).

Increased Student Enrollment Moreover, we need to consider the potential increase in student enrollment due to improved accessibility and availability of the chatbot. We will also assume that the number of students enrolling at the university will increase by 1% since the AI chatbot has made it much easier to access information about how to apply or what they can study.

An AI chatbot could also guide potential students through the application process and send them updates if their application status has changed. These improvements have the potential to generate an even higher increase in student enrollments since it is easier than ever to apply to the university.

Increased Student Retention But the university won't just see an increase in enrollment. Let's assume that improved customer experience and support through the chatbot lead to a 1% increase in student retention. Valuable Data and Insights The AI chatbot also has the ability to collect and analyze user data. This will give the university access to in-depth analytics and insights which will help them make crucial data-driven decisions over the year. For the sake of this analysis, let's assign a conservative estimate of \$10,000 per year as the value derived

from the chatbot's ability to collect and analyze user data. To keep this calculation conservative and realistic, we have not assigned a value for cost avoidance. However, it's important to remember that the AI chatbot will also help the university avoid other costs throughout the year. This includes costs like the need for additional call centres or hiring temporary staff during peak periods. **The ROI of implementing an AI chatbot (2) Calculating the ROI** Now that we have established some assumptions and quantified the savings to the university, we can calculate the ROI. The ROI is calculated by taking the total benefits, subtracting the total cost, and then dividing that number by the total cost. The total benefits to the university include a reduction in staffing costs, increased efficiency, increased enrolments, student retention, and insights and analytics. Following our assumptions, the total benefits tally up to a whopping \$4,088,000. On the other hand, the total cost, which includes the yearly licensing fees, implementation fee and possible maintenance costs, is a mere \$96,000. So let's do the math:

Total Benefits **Total Benefits: Reduction in Staffing Costs + Increased Efficiency + (Yearly Tuition Costs * Number of Students * Increase in Enrolments) + Analytics and Insights + (Student Retention Increase Number of Students * Yearly Tuition Costs)**

Total Benefits: $(\$2,500 * 2 * 12) + (\$1,500 * 12) + (\$20,000 * 10,000 * 0.01) + \$10,000 + (10,000 * 0.01 * \$20,000)$ Total Benefits: $\$60,000 + \$18,000 + \$2,000,000 + \$10,000 + \$2,000,000$ Total Benefits: $\$4,088,000$ Total Cost Total Cost: Yearly Licensing Fees + Implementation Fee + Maintenance Fees Total Cost: $\$60,000 + \$30,000 + \$6,000 = \$96,000$ ROI ROI: $(\text{Total Benefits} - \text{Total Cost}) / \text{Total Cost} * 100$ ROI: $(\$4,088,000 - \$96,000) / \$96,000 * 100$ ROI: 4158.33% Interpreting the ROI Note: The ROI depicted in this

hypothetical example is intended to illustrate the potential scale of benefits that could be realized under certain conditions. It is important for universities to undertake a detailed analysis of their unique situations to determine the feasibility and actual ROI of implementing an AI chatbot. **The total ROI of the AI chatbot to the university is an astounding 4158.33%.** This ROI indicates that for every dollar spent on implementing an AI chatbot, a university could potentially gain \$41.58. With such a high ROI, it's clear that investing in the AI chatbot is worthwhile for the university. **Not only does it save money on staffing and improve efficiency, but it also leads to increased enrolment, student retention, and valuable insights.** With a return of over 40 times the initial investment, it won't be long before the AI chatbot pays for itself and begins generating significant savings and benefits for the university.