Artificial Intelligence in Education: Opportunities, Challenges, and Policy Considerations for Congress

Testimony by Erin Mote

Introduction

Artificial intelligence (AI) is an arrival technology. Arrival technologies—like electricity, social media, or the internet—are massively disruptive and rapidly reshape how we teach, learn, and live. They create extraordinary opportunities but also demand that we confront critical questions about disruption, opportunity, access, safety, and efficacy. Right now, AI is disproportionately accessed and implemented across school communities - only 25% of educators have used AI in the classroom or in their preparation, and access to this technology and the resources to support building AI literacy are unevenly distributed[1]. How we support AI in education and its adoption - must be about embracing opportunity, access, and fairness - especially for under resourced schools and communities. Our decisions today will profoundly impact the future of education, our nation's economic prosperity, national security, and society.

The advent of AI marks a significant turning point in technological advancement, potentially reshaping all aspects of our society. Among these, the education sector stands poised for - and is already witnessing - a profound transformation in how our education systems operate and what they need to do to ensure that every child is "AI literate" and prepared to thrive in an AI-empowered world. This testimony aims to provide a comprehensive and objective overview of the current state of AI in education, exploring its potential benefits, inherent risks, ethical considerations, existing policy frameworks, diverse stakeholder perspectives, and future trajectory. The goal is to provide this Committee and Congress with the necessary information to work on a bipartisan basis to make informed decisions regarding supporting AI's safe and responsible adoption into our nation's education system by supporting and empowering states, districts, families, and educators. Innovation and safety are not in opposition in an AI-empowered future; instead, by balancing both, we can build trust and knowledge of this technology within our communities, foster accelerated development from industry that is beneficial to all students, and drive needed improvements in student outcomes. **To that end, my remarks today will highlight AI's potential benefits and challenges to our education system and suggest five specific policy recommendations as you begin drafting and considering legislation.** These recommendations for Congress include the need to invest in critical public infrastructure including digital access; support essential research, development, and data to empower the field; establish foundational national frameworks for the safe and responsible AI use while promoting innovation; support AI literacy programs, including both for students and educators through professional development, and foster collaboration and

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[1] Julia H. Kaufman, Ashley Woo, Joshua Eagan, Sabrina Lee, and Emma B. Kassan, *Uneven Adoption of Artificial Intelligence Tools Among U.S. Teachers and Principals in the 2023–2024 School Year*, RAND Corporation, RRA134-25, 2024. https://www.rand.org/pubs/research_reports/RRA134-25.html

dialogue to center districts, states, educators, and parents alongside industry to shape congressional engagement and policy.

Because AI presents unprecedented opportunities and significant challenges for the United States, a crucial element in effectively navigating this evolving landscape is a robust and adaptable education system capable of fostering AI literacy, preparing a future-ready workforce, and addressing this technology's ethical and societal implications. No state or district has the resources to do this on its own. Across-the-board cuts to the US Department of Education, National Science Foundation, Department of Commerce, NIST program, and others pose a significant threat to the nation's ability to meet these demands. **These cuts could result in a decline in national innovation, weakening our global competitiveness in AI, putting our nation at a significant disadvantage in the global AI race, and widening existing educational disparities.**

The rapid proliferation of AI within educational technology presents unprecedented opportunities alongside critical challenges concerning the safety, privacy, access, and ethical implications for students and educators alike. Recognizing the urgent need for guidance in this evolving landscape, the EDSAFE AI Alliance was formed in 2021, predating the widespread public availability of sophisticated generative AI models. This proactive initiative led to development of the "SAFE" framework, which centers on Safety, Accountability, Fairness, Transparency, and Efficacy. The framework serves as a vital compass for navigating the complexities of AI in education by synthesizing over twenty-four established global standards and guidelines, including GDPR and UNESCO's recommendations. Its fundamental purpose is to foster well-informed discussions among diverse stakeholders spanning education and industry, streamline the often-fragmented process of policy development, and ensure that the integration of AI in education adheres to core principles that safeguard students, protect parental rights, empower educators, and promote responsible development and deployment of these tools.

InnovateEDU is a nonprofit, nonpartisan organization proud to house and support the EDSAFE AI Alliance. The EDSAFE AI Alliance framework and the Alliance are crucial for navigating the rapidly evolving landscape of artificial intelligence in education. The Alliance fosters collaboration and knowledge sharing by bringing together diverse stakeholders, including educators, policymakers, researchers, and technology companies, ensuring that AI innovations prioritize student well-being, equity, and effective learning outcomes.

The EDSAFE AI framework is not merely a beneficial tool but an imperative necessity for the responsible and effective integration of AI in education because it furnishes a structured roadmap and a common language for policymakers, educators, and technology developers navigating this fast-paced domain. By prioritizing the safety of student data and establishing clear guidelines for accountability, fairness, and efficacy, the framework directly addresses key ethical and practical concerns inherent in AI applications within learning environments. It aims to build trust with parents, students, educators, and industry partners to accelerate AI literacy and AI innovation and adoption. Initiatives such as the EDSAFE AI Policy Labs network - a network of 12 school districts across the country from Georgia to California to Colorado - develop practical, open-source policy resources aligned with the SAFE framework so that

schools and districts can use the framework to support implementation. In addition, over 160 companies have articulated demonstrable alignment to the framework, including major LLMS and educational technology providers, signaling the critical and necessary partnership between industry and the education sector. Ultimately, the EDSAFE AI Alliance and its framework aim to build trust in AI within the education sector, promoting its **potential benefits** to enhance teaching and learning while mitigating **potential risks**.

Potential Benefits of AI in Education

As mentioned, the benefits of AI for education are potentially transformational, and I offer three main areas where AI can, and already is, helping educators and students:

Personalized Learning and Improved Student Outcomes: AI's growing capacity to tailor educational content and learning pace to each student's unique needs and individual learning pathways represents a significant advancement in educational technology. This personalized approach has been shown to increase student engagement and overall motivation in the learning process, reducing chronic absenteeism and accelerating positive student outcomes[2]. Furthermore, AI systems can provide students with immediate and detailed feedback on their work, which enhances their understanding of concepts and ultimately leads to improved learning outcomes[3]. By analyzing vast amounts of data on learners' progress, strengths, and weaknesses, AI, alongside an educator, can create customized educational pathways that allow students to learn at their best speed and concentrate on specific areas to maximize cognitive range. The promise of AI and its application to students with disabilities and learning differences is particularly notable. AI education models are being developed to support earlier, more accurate, and widely available screening technology for disabilities like dyslexia. There is early promise from an IES and NSF-funded research project focused on AI at the University of Buffalo. We have evidence that AI can significantly accelerate the ability to offer universal screening for dyslexia in our classrooms, speeding up a process that would take weeks to a single afternoon while keeping an educator in the loop. Not only does this free up teacher time, it also allows for earlier intervention[4]. While personalized learning holds tremendous promise for revolutionizing education, its effectiveness is intrinsically linked to the quality and impartiality of the AI algorithms and the data they analyze. It is critical to ensure fairness and to actively prevent the perpetuation of biases in these systems to achieve genuinely equitable opportunities for improvements in student outcomes. AI could inadvertently reinforce or exacerbate pre-existing achievement gaps among student groups if the data utilized to personalize learning pathways reflects algorithmic inequalities. Therefore, the implementation of robust data governance frameworks, data infrastructure, and the integration of effective bias detection mechanisms are of paramount importance.

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[2] Joseph, A.R. (2024). *The Impact of Personalized Learning on Intrinsic Motivation, Academic Proficiency, and Behavioral Issues*. ProQuest LLC. ERIC Number: ED651862.
https://eric.ed.gov/?q=sTUDENT+AND+ACADEMIC+AND+MOTIVATION&ff1=dtyIn_2023&id=ED651862
[3] U.S. Department of Education, Office of Educational Technology, *Artificial Intelligence and Future of Teaching and Learning: Insights and Recommendations*, Washington, DC, 2023. https://www.ed.gov/sites/ed/files/documents/ai-report/ai-report.pdf
[4] University at Buffalo. "National AI Institute for Exceptional Education - University at Buffalo".
https://www.buffalo.edu/ai4exceptionaled.html

Importantly, technology, in and of itself, is not a panacea for educational challenges. A study conducted using the Kyron Learning platform, an AI-assisted learning tool, revealed that while students who engaged with the platform reported favorable experiences, no statistically significant improvements in overall academic outcomes, such as assessment pass rates or time taken to complete the course[5]. This finding suggests that adopting AI-powered tools does not automatically translate into improved student outcomes. The effectiveness of AI in education is likely mediated by several crucial factors, including the quality of its integration into the existing curriculum, the strategies employed to ensure student engagement with the technology, and the level of support provided to educators in utilizing these new tools. Successful implementation of AI in education necessitates a holistic approach that carefully considers established pedagogical practices and the specific needs of both students and educators within the learning environment.

Enhanced Efficiency for Educators and Administrators: AI can significantly enhance the efficiency of educators and administrators by automating a range of time-consuming administrative tasks. These tasks include grading student assignments, managing class schedules, and generating various reports, freeing up valuable time to redirect towards more meaningful interactions with students[6]. This automation allows teachers to dedicate more time to building relationships with their students. A recent study from the Centers for Disease Control on youth mental health revealed that with just one meaningful connection with an adult in school - a teacher, a coach, even a bus driver - could reduce suicidal ideation in young people by 33%[7]. Compare that to a recent Stanford study on Replika AI - a service that allows you to create an AI companion or virtual twin. This study found that suicidal ideation was reduced by 3%[8]. When we consider what we want for young people to meet the burgeoning mental health crisis in this country, creating opportunities to strengthen the human element of education remains paramount. AI should augment, not replace, the human relationships that drive improved student learning and student well-being.

Furthermore, AI tools can assist educators in the often time-consuming processes of lesson planning and content creation, saving them valuable time and effort. By analyzing student performance data, AI can provide educators with valuable, data-driven insights to better inform and tailor their teaching strategies and interventions to meet each student's needs or unlock their passion for the given topic. Automating routine administrative tasks through AI can alleviate teacher burnout and enable educators to concentrate on their profession's more complex and human-centered aspects, such as providing mentorship and fostering critical thinking skills in their students. Addressing the significant concern of teacher workload, AI can

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[5] The Impact of an AI Tool on Student Outcomes | WGU Labs, accessed March 27, 2025, https://www.wgulabs.org/posts/the-impact-of-an-ai-assisted-learning-tool-on-student-outcomes-research-brief

[6] AI in Schools: Pros and Cons | Illinois, accessed March 27, 2025, https://education.illinois.edu/about/news-events/news/article/2024/10/24/ai-in-schools--pros-and-cons

[7] School Connectedness and Risk Behaviors and Experiences Among High School Students — Youth Risk Behavior Survey, United States, 2021MMWR - CDC.

[8] Maples, J., et al. "Loneliness and suicide mitigation for students using GPT3-enabled chatbots." PubMed. https://pubmed.ncbi.nlm.nih.gov/38609517/

be a valuable tool in redistributing various tasks, allowing teachers to dedicate more time and energy to student well-being and facilitating more profound learning experiences.

Improved Accessibility and Engagement: AI-powered tools offer significant potential for improving accessibility in education, particularly for students with disabilities. Technologies such as text-to-speech and speech-to-text can enable these students to engage more fully with classroom materials and participate more actively in learning activities[9]. Furthermore, AI can enhance student engagement by generating tailored content that directly resonates with their unique needs and individual progress within the curriculum. While AI holds considerable promise for making education more inclusive and engaging for a broader range of learners, the design and implementation of these tools must be carefully considered to avoid creating unintended barriers or inequities in access. Ensuring that AI-powered tools are user-friendly and readily available to all students is paramount for maximizing their potential to improve accessibility and engagement in education.

Potential Risks and Challenges of AI in Education

At the same time, AI presents several potential educational risks and challenges. I highlight three main areas where Congress should focus:

Data Privacy and Security Concerns: The implementation of AI systems in education necessitates the collection and analysis of substantial amounts of sensitive student data, including personal information, academic records, and behavioral patterns. This need can raise significant risks regarding how these data are securely stored, who is authorized to access it, and the potential for its misuse or exposure through data breaches. At the same time, there are bedrock privacy laws in place (including Family Educational Rights and Privacy Act (FERPA) Protection of Pupil Rights Amendment (PPRA) and Children's Online Privacy Protection Act (COPPA)), that, when adhered to, can address some of these issues; more support, training, and partnership between industry, government, and the education ecosystem are needed. History has shown that educational technology platforms, school districts, and state education systems can be vulnerable to cyberattacks, as evidenced by past data breaches in online exam proctoring services or cyberattacks on districts like LAUSD[10]. Schools, districts, and states continue to need cybersecurity assistance[11], and reestablishing the MS-ISAC is critical to protecting schools and children from bad actors. Cybersecurity is expensive, and schools often lack the necessary resources to address these risks. To mitigate these risks, it is crucial to implement robust data protection measures, including advanced encryption techniques, data anonymization protocols, and transparent mechanisms for obtaining informed consent from students and parents regarding data collection and usage. In addition to the technical protections that need to exist, data privacy and security must be protected, and a partnership between industry and education technology platforms and their school partners must be

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[9] Smith, J. (2024). AI and Learning Disabilities. In A. Editor & B. Editor (Eds.), *Artificial Intelligence and Educational Inclusion* (pp. 120-145). Oxford Academic. https://academic.oup.com/book/58946/chapter/493006717

[10] UpGuard. (2025, January 8). *Why is the Education Sector a Target for Cyber Attacks?* UpGuard. Retrieved from https://www.upguard.com/blog/education-sector-cyber-attacks

[11] The 74. (2025, February 10). *Kept in the Dark: Inside a Trio of Los Angeles School Cyberattacks.* The 74. Retrieved from https://www.the74million.org/article/kept-in-the-dark-inside-a-trio-of-los-angeles-school-cyberattacks/

established that accounts for the training and AI literacy necessary to ensure these tools are used correctly. Given the increasing sophistication of cyber threats and the sensitive nature of student data, cybersecurity and data protection in schools require a consistent federal approach with clear guidance to ensure national security and the well-being of students.

Another significant challenge is the lack of transparency surrounding how personal data is processed by AI algorithms, often referred to as the "black box" problem[12]. This opacity can limit individuals' understanding and control over their data or the data they use. Transparency in AI algorithms and the processes involved in data handling is essential for fostering accountability and ensuring that AI is utilized ethically and in full compliance with established privacy regulations and parental rights. Understanding how AI systems arrive at their decisions is crucial for identifying and effectively mitigating potential biases embedded within the algorithms and ensuring overall fairness in their application within educational contexts.

Algorithmic Inequities: No education technology tool currently used in America's classrooms is free of bias. Instead, we must work to mitigate the existing bias and increase reliability and trust in the outputs. These biases can arise from the data used to train the algorithms, which may reflect and even perpetuate existing human biases prevalent within society, including for the one in five students in this country with a learning disability[13]. For example, studies have indicated that AI inequalities can negatively impact non-native English speakers, with their written work sometimes being falsely flagged as AI-generated, potentially leading to unfair accusations of cheating[14]. A lack of algorithmic reliability can manifest in unfair grading systems, admissions decisions that unintentionally exclude or privilege certain groups, or learning tools that may work more effectively for some demographics than others[15]. Examples of bias have been observed in facial recognition technology, which may not accurately recognize Black students, and in language models that can perpetuate harmful stereotypes, such as a lower grade for a writing assignment where there are dialectical differences for rural students[16]. Addressing algorithmic inequities requires a comprehensive and multi-faceted approach. This includes utilizing diverse and genuinely representative training data, empowering industry with the data and frameworks to regularly audit AI algorithms to identify and mitigate biases, ensuring transparency in developing these algorithms, and establishing ongoing monitoring processes to detect and address any discriminatory outcomes that will arise. Current edtech evaluation frameworks and procurement guidelines may not be sufficient for AI tools, and

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[12] Zednik, C. (2019). *Solving the Black Box Problem: A Normative Framework for Explainable Artificial Intelligence*. arXiv. Retrieved from https://arxiv.org/pdf/1903.04361/1000

[13] CoSN (Consortium for School Networking), & CAST. (2024, September 18). *CoSN report explores strategies for navigating AI and accessibility in education*. DATIA K12. Retrieved from https://www.datiak12.io/research/article/15684249/cosn-report-ai-can-enhance-accessibility-for-students-with-disabilities-but-also-carries-risks

[14] D-Lab. (2025, January 21). *The Creation of Bad Students: AI Detection for Non-Native English Speakers*. UC Berkeley. Retrieved from https://dlab.berkeley.edu/news/creation-bad-students-ai-detection-non-native-english-speakers

[15] World Journal of Advanced Research and Reviews. (2025). *Algorithmic bias in educational systems: Examining the impact of AI-driven decision making in modern education*, *23*(02), 253-263. Retrieved from https://journalwjarr.com/sites/default/files/fulltext_pdf/WJARR-2025-0253.pdf

[16] NEA. (2024, February 22). *Does AI Have a Bias Problem?* National Education Association. Retrieved from https://www.nea.org/nea-today/all-news-articles/does-ai-have-bias-problem

districts have cited the need for new standards, especially ones that integrate educator and student feedback to ensure the tools being procured and used are reliable, fair, and efficacious.

Furthermore, AI can potentially deepen the digital access divide that dominates our rural communities, mainly if access to the necessary technology and adequate AI literacy training is not provided equitably across all socioeconomic levels and geographies[17]. Students from disadvantaged backgrounds in rural, urban, and suburban schools may face significant barriers in accessing the required devices, reliable internet connectivity, and support to utilize AI-powered educational tools effectively. To prevent this, policies must be implemented to ensure equitable access to AI tools and comprehensive AI literacy training for all educators and students, regardless of their zip code. AI literacy, a form of digital literacy, is the knowledge, skills, and competencies needed to safely use and understand artificial intelligence and critically evaluate the implications, limitations, and ethical considerations of AI use. Ensuring universal access to reliable internet services and appropriate technological devices is a fundamental prerequisite for guaranteeing that all students can benefit from integrating AI in education to adequately prepare them to work within an AI empowered workforce and remain globally competitive.

Impact on the Role of Teachers: With the increasing integration of AI into education, concerns have been raised about the potential for AI to replace human teachers in the classroom. However, we know from the science of learning and development, from our experience in the COVID pandemic, and early research on AI that teachers are and will continue to be essential in building relationships, personalizing pathways, and leading the teaching and learning that can help every student achieve their full potential. The prevailing perspective suggests a shift in the traditional role of the teacher, moving from being primarily a deliverer of content to becoming more of a facilitator, guide, and mentor for students[18]. To effectively navigate this evolving landscape, teachers will require adequate training and ongoing support to integrate AI tools seamlessly into their existing teaching practices. While AI can undoubtedly automate specific routine tasks, the essential human element of teaching, which includes providing mentorship, offering crucial support, and fostering the development of critical thinking skills, remains irreplaceable. Therefore, the focus should be on leveraging AI to augment the capabilities of teachers rather than viewing it as a direct replacement for their vital role in education. Investing in comprehensive professional development opportunities for educators, such as through Title II and Title IV funds for professional development are contained within the Every Student Succeeds Act (ESSA), is critical to ensure they are well-equipped to utilize AI tools effectively and enhance their students' overall teaching and learning experience. Another potential challenge associated with the increased use of AI in education is the concern about reducing human interaction between teachers and students. This decrease in face-to-face communication could negatively impact the social-emotional aspects of learning and potentially

[17] Mindell, D. A., & Reynolds, E. (2024, February 21). (PDF) Artificial Intelligence and Inequality: Challenges and Opportunities. *Qeios*. Retrieved from
https://www.researchgate.net/publication/378376537_Artificial_Intelligence_and_Inequality_Challenges_and_Opportunities

[18] ResearchGate. (2024). *Facing New Challenges: The Role of Teachers as Agents of Change in the 21st Century*.
https://www.researchgate.net/publication/383725046_Facing_New_Challenges_The_Role_of_Teachers_as_Agents_of_Change_in_the_21st_Century

hinder the development of crucial interpersonal skills in students[19]. It is therefore essential to maintain a careful balance between AI-mediated learning experiences and opportunities for direct, face-to-face interaction to ensure the holistic development of students. Educational strategies should intentionally incorporate activities and projects that foster human connection and collaboration alongside the integration of AI tools, thereby safeguarding the critical dimensions of learning.

Other Challenges: Implementing AI technologies in education can involve significant financial costs, varying wildly depending on the specific AI type being deployed. These expenses often encompass the initial costs of procuring AI software and hardware, the ongoing costs associated with system maintenance, necessary software updates, and the potential need for repairs[20]. These costs can be prohibitively high for schools and districts with limited financial resources, particularly those in under-resourced communities. To address this, it is crucial to develop comprehensive funding and resource allocation plans that ensure all schools, regardless of their geographic location, have the opportunity to access the potential benefits of AI in education. Without adequate financial support, the widespread adoption of AI could inadvertently exacerbate existing inequities in school resources, further disadvantaging already vulnerable student populations.

There is also a risk of over-reliance on AI in education, which could undercut the essential role of educators and potentially hinder the development of critical thinking skills and independent learning abilities in students[21]. Recent studies have shown that overreliance on AI tools diminishes young people's critical thinking[22] and creative problem solving[23] - two critical skills the Fortune 500 CEOs say are essential for their future workforce[24]. Students may become overly dependent on AI tutoring systems to solve problems or complete tasks, reducing their capacity or motivation to engage in deep, analytical thinking[25]. Critical thinking is a fundamental skill that students need to cultivate, as it equips them to analyze information objectively, make reasoned judgments, and solve complex problems effectively. To counter this potential challenge, curricula should be intentionally designed to foster critical thinking and problem-solving skills alongside the integration of AI tools. The goal should be to ensure that AI is a valuable tool to augment human intelligence and learning, rather than allowing it to replace the essential development of higher-order cognitive skills. Educational practices should therefore

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[19] ResearchGate. (2023). *Communication Competency: The Impact of Interpersonal Communication on Student's Learning Activities.* Retrieved from https://www.researchgate.net/publication/374090271_Communication_Competency_The_Impact_of_Interpersonal_Communication_on_Student's_Learning_Activities

[20] Eastes, S. (2024, July 3). Navigating the High Costs of AI in EdTech. The Learning Agency. Retrieved from https://the-learning-agency.com/the-cutting-ed/article/navigating-the-high-costs-of-ai-in-edtech/

[21] Gerlich, M., & Gerlich, R. (2023). AI Tools in Society: Impacts on Cognitive Offloading and the Future of Critical Thinking. Technologies, 15(1), 6. https://doi.org/10.3390/technologies15010006

[22] Kausar, S. (2024). The Impact of Artificial Intelligence (AI) on Students' Academic Development. Education Sciences, 15(3), 343. https://doi.org/10.3390/educsci15030343

[23] Essel, H. B., Amankwah, F., Cobblah, A. A., & Baafi, R. A. (2024). Risks of AI-Assisted Learning on Student Critical Thinking. ResearchGate. Retrieved from https://www.researchgate.net/publication/382878289_Risks_of_AI-Assisted_Learning_on_Student_Critical_Thinking

[24] Roberson, D. (2024, January). Must-Have Skills For The Workforce Of The Future. Chief Executive. Retrieved from https://chiefexecutive.net/must-have-skills-for-the-workforce-of-the-future/

[25] Gerlich, M., & Gerlich, R. (2023). AI Tools in Society: Impacts on Cognitive Offloading and the Future of Critical Thinking. Technologies, 15(1), 6. https://doi.org/10.3390/technologies15010006

emphasize activities and assessments that require students to engage in deep analysis, synthesis, and evaluation, even when utilizing AI for specific tasks. As an education system, we need to double down on the human elements of learning, reasoning, and thinking so that young people can work alongside AI and not be replaced by it.

Finally, it is essential to acknowledge the unpredictability of AI and its potential to generate inaccurate or even misleading information. In their current state, AI models can sometimes fabricate information, a phenomenon called "hallucinations"[26]. Right now, AI is like conversing with a brilliant person you cannot trust. Given this inherent limitation, students must be explicitly taught how to evaluate any content generated by AI critically and to verify information obtained from these tools using multiple reliable sources. Developing strong AI literacy skills including the knowledge, skills, and competencies needed to safely use and understand artificial intelligence and critically evaluate its implications, limitations, and ethical considerations is essential for navigating the potential pitfalls of using AI for research and learning, ensuring that students do not blindly accept AI-generated content as factual or accurate.

Future Trends and Implications of AI for the Education System

Short-Term Impacts: The immediate future of education will be significantly shaped by the rapid advancements and integration of AI, requiring the establishment of clear guidelines and proactive and thoughtful approaches to maximize its benefits while effectively mitigating potential risks. We will likely witness an increased adoption of AI for personalized learning experiences and the widespread use of adaptive learning platforms that can tailor educational content to individual student needs. We can also anticipate a greater integration of AI tools designed to automate routine administrative tasks for educators and to assist them in the often time-consuming processes of lesson planning and grading student work. Students will likely continue to increase their use of AI for various academic purposes, including conducting research, drafting written assignments, and seeking help with homework. This growing prevalence of AI in education will necessitate that educators adapt their teaching practices and acquire the skills needed to integrate these new technologies into their classrooms effectively. Furthermore, there will be an increasing focus on addressing the ethical concerns associated with AI in education and developing clear guidelines and policies to govern its responsible use.

Long-Term Implications: Looking further into the future, AI has the potential to fundamentally reshape the entire education system, moving away from more traditional, one-size-fits-all models towards learning experiences that are significantly more personalized and dynamically adaptive to individual learners. The roles of teachers are also likely to evolve considerably, with a potential shift towards a greater emphasis on mentorship, providing individualized guidance to students, and fostering the development of higher-order thinking skills such as critical analysis and problem-solving [15]. There will be an increasing need to prioritize the teaching of AI literacy to students, equipping them with the essential skills required to navigate and succeed in an increasingly AI-driven workforce. We can also anticipate the continued development of even

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[26] Li, J., Lyu, T., Zhang, Z., & Li, Z. (2024). AI hallucination: towards a comprehensive classification of distorted information in artificial intelligence-generated content. [1] *Humanities and Social Sciences Communications*, *11*(1), 217. https://doi.org/10.1057/s41599-024-02707-3

more sophisticated AI-powered educational tools and platforms that offer enhanced capabilities and functionalities. Throughout these long-term transformations, the ongoing need to address critical ethical considerations, ensure equity of access and outcomes for all learners, and carefully consider the impact of AI on the crucial element of human interaction within the educational experience will remain paramount. In the long run, the integration of AI holds the promise of creating a more personalized, efficient, and ultimately more equitable education system for all learners. However, realizing this ambitious vision will necessitate careful planning, sustained investment, and an unwavering commitment to proactively addressing the various challenges and ethical dilemmas that arise along the way.

Impact of Recent Actions on AI Innovation in K12 Education

The US education system's ability to effectively prepare students for an AI-driven world hinges on developing and implementing relevant and high-quality AI tools and capacity across all levels of education. This requires critical capacity in research, data, technology, and more at the Department of Education, National Science Foundation, Commerce Department, and other agencies.

The operational capacity of the Department of Education has been significantly impacted by a reduction in its workforce by nearly 50% since January[27]. Certain offices within the Department have experienced near-complete staff elimination, potentially rendering them non-functional[28]. Notably, offices overseeing critical functions such as protecting federally guaranteed student rights, research, and data collection have been significantly affected[29]. The Institute for Education Sciences (IES), the Department's research arm, has seen most of its research contracts terminated and over three-quarters of its staff cut, and the National Center for Education Statistics (NCES) has been reduced to a minimal number of employees[30]. Such drastic reductions in these key areas could severely hinder the ability to gather reliable education data, conduct rigorous research on effective practices (including in AI education), and ensure equitable access to educational opportunities, all of which are foundational for navigating the challenges and opportunities presented by artificial intelligence.

Through multiple administrations, the Department has played a vital role in informing state and local action on AI and other education technologies. In October 2024, for example, the Department released "Empowering Education Leaders: A Toolkit for Safe, Ethical, and Equitable AI Integration."[31] This toolkit signified a recognition of the increasing role of AI in education and an effort to guide education leaders on how to incorporate AI responsibly and

[27] U.S. Department of Education. (2025, March 21). *U.S. Department of Education initiates reduction in force.* Retrieved from https://www.ed.gov/about/news/press-release/us-department-of-education-initiates-reduction-force

[28] Binkley, C. (2025, March 25). *Education Department layoffs gut civil rights office, raise concerns over enforcement.* Associated Press. Retrieved from https://apnews.com/article/trump-education-department-layoffs-civil-rights-8cbf463cce765f497c10d688ab4d51e1

[29] American Educational Research Association, & Other Education Research Associations. (2025, March 25). *Joint Letter to Congress.* Retrieved from AERA and Other Education Research Associations Issue Joint Letter to Congress

[30] American Educational Research Association, & Other Education Research Associations. (2025, March 25). *Joint Letter to Congress.* Retrieved from AERA and Other Education Research Associations Issue Joint Letter to Congress

[31] U.S. Department of Education, Office of Educational Technology. (2024, October). *Empowering education leaders: A toolkit for safe, ethical, and equitable AI integration* (ED661924). U.S. Department of Education. https://files.eric.ed.gov/fulltext/ED661924.pdf

ethically. This resource was an invaluable guide for states and districts that did not have sufficient technical expertise or capacity to take on this emerging technology.

Furthermore, the Office for Civil Rights within the Department had issued guidance to avoid discriminatory uses of artificial intelligence in schools[32]. This guidance demonstrated an understanding of the potential for AI to exacerbate existing inequalities and the importance of ensuring its equitable application in educational settings, from college admissions decisions to allocating funding. Beyond internal initiatives and guidance, the Department of Education has also engaged in research partnerships related to AI. Notably, it has collaborated with the National Science Foundation (NSF) on the "AI-Augmented Learning for Individuals with Disabilities" initiative[33]. This partnership underscores the potential of AI to address specific educational needs, particularly for learners with disabilities, and leverages the research expertise of the NSF in technology-driven innovation. The NSF also leads the National Artificial Intelligence Research Institutes program, which focuses on AI-augmented learning[34], and the EducateAI initiative aimed at expanding AI education nationwide[35].

The loss of the Office of Educational Technology (OET) presents a particular challenge. This office plays a crucial role in informing the effective integration of technology, including AI, into educational practices. The dissolution of OET will leave a void in leadership and support for AI education initiatives, **potentially leaving the US behind other nations in fostering AI literacy and advancements among students and educators.**

Reduced investment in education, particularly in areas related to science, technology, engineering, and mathematics (STEM), and specifically AI, carries significant long-term consequences for the United States. It risks causing the nation to fall behind other countries prioritizing AI education and research as crucial for future economic competitiveness. A**s nations like China[36], Singapore[37], and South Korea[38] actively introduce AI curricula and AI literacy into their education system, a decline in US investment will lead to a loss of global leadership now with generational consequences in this critical technological domain.**

A less prepared workforce, resulting from inadequate investment in AI education and workforce development programs, would hinder the nation's ability to innovate and compete effectively in

[32] U.S. Department of Education, Office for Civil Rights. (2024, November). *Avoiding the discriminatory use of artificial intelligence* (ED661946). U.S. Department of Education. Retrieved March 29, 2025, from https://eric.ed.gov/?ff1=subComputer+Software&id=ED661946&q=uses&utm_source=chatgpt.com

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AI. A shortage of skilled AI professionals could stifle technological advancements, limit economic growth, and even impact national security, as AI is increasingly recognized as a vital technology for defense and intelligence. Furthermore, federal budget cuts to research and development, including those affecting education, could significantly undermine America's long-term leadership in artificial intelligence innovation. Foundational research, often supported by federal funding, is crucial for major technological breakthroughs, and reducing this investment could have severe consequences for the nation's future competitiveness in AI.

Recommendations for Congressional Action

1. **Invest in Research and Development:** Congress should allocate federal funding to support rigorous research to advance several goals, including a deeper understanding of the multifaceted impact of AI on learning outcomes, teaching practices, and overall student development across all age groups and diverse subject areas. Investing in developing robust ethical AI frameworks and effective bias detection and mitigation tools tailored explicitly for applications within the education sector is also crucial. Furthermore, funding should be directed towards promoting research into the most effective pedagogical strategies for integrating AI in ways that demonstrably enhance student learning and foster the development of critical thinking skills. This work could be done through more rapid cycle research and development mechanisms, including supporting a vehicle like NCADE - a proposed center within the Institute of Education Sciences (IES). It is envisioned to function similarly to the Defense Advanced Research Projects Agency (DARPA) but focused on **education research and development**. The goal of NCADE would be to develop and scale innovative approaches and tools for teaching and learning through rapid testing and iterative development. Likewise, special attention should be paid to supporting the development of state and local research and development capacity so that R&D is contextually appropriate to the local community's needs. Furthermore, funding should be directed towards promoting research into the most effective pedagogical strategies for integrating AI in ways that demonstrably enhance student learning and foster the development of critical thinking skills. Finally,

2. **Support Investment in Public Data Infrastructure and Data Systems: Federal** support for education data systems is crucial for informed decision-making at all levels, from classrooms to state and national policy. Standardized, interoperable data systems allow educators and policymakers to track student progress, identify achievement gaps, and allocate resources effectively to address specific needs. In the age of artificial intelligence, robust federal support for education data systems is crucial to unlock the transformative potential of AI for learning and workforce development and make AI models more reliable and trustworthy. Public data infrastructure that allows for anonymized student data, protecting privacy while supporting better tool development, provides industry access to large-scale datasets essential for training and validating AI models, fostering innovation, and reducing development costs. Ultimately, this investment in data infrastructure empowers evidence-based practices that lead to improved educational outcomes and better educational AI tools for all students.

3. **Develop National Guidelines and Policies:** Congress should take the lead in establishing clear and comprehensive guidelines and highlighting best practices

concerning the use of AI in education to support states and districts. This includes directing NIST to develop robust zero-trust drafts and standards specifically tailored to the educational context, ensuring full compliance with existing regulations while proactively addressing emerging challenges posed by AI technologies. This will allow both the districts and schools to navigate building knowledge and use of this technology, and also empower industry to develop safe and responsible tools by reducing regulatory burdens, building public infrastructure, and reducing development costs through alignment and coherence. Additionally, a clear definition of AI literacy [39]and a strategy to address the development of students' and educators' AI literacy to ensure a baseline level of understanding of the technology and its responsible use.

4. **Support Educator Professional Development:** To ensure that educators are well-prepared to navigate the evolving landscape of AI in education, Congress should provide dedicated funding to support comprehensive professional development programs, such as through existing Title II and Title IV programs. These programs should equip teachers with the essential knowledge, practical skills, and ongoing support needed to utilize AI tools in their classrooms effectively and to adapt their teaching practices to leverage the unique capabilities of these technologies.

5. **Promote Equitable Access:** Congress should invest in crucial public connectivity infrastructure and targeted programs to ensure that all communities have access to the necessary technology, reliable internet connectivity, and adequate technical support required to benefit from AI in education fully. Special attention and resources should be directed towards supporting underserved schools and students, including students with disabilities and those in rural communities, to bridge the digital access divide effectively.

6. **Foster Collaboration and Dialogue:** Congress should actively promote collaboration and open dialogue among key stakeholders to facilitate a thoughtful and effective approach to integrating AI in education. This includes convening educators, students, parents, technology experts, policymakers, and researchers to share their perspectives, insights, and concerns regarding the responsible use of AI in educational settings.

Conclusion

Artificial intelligence presents a transformative force with the potential to significantly impact the education system, offering both remarkable opportunities and considerable challenges. Proactive and informed policymaking at the congressional level is essential to ensure that AI is harnessed responsibly, ethically, and equitably to enhance learning outcomes for all students across the nation. By balancing the potential benefits of AI with the critical need to safeguard student privacy, address algorithmic bias, provide robust support for educators, and preserve the indispensable human element in education, we can collectively work towards ensuring our shared economic prosperity, global competitiveness, and human flourishing.

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[39] AI literacy, a form of digital literacy, is the knowledge, skills, and competencies needed to safely use and understand artificial intelligence and critically evaluate the implications, limitations, and ethical considerations of AI use.

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