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Acton Negates

The AI industry is propped up by corporations who facilitate their own studies in order to garner support, thus the AI industry is a facade of success

Ben Williamson, of the University of Edinburgh concludes in 2024 (Ben Williamson is a Chancellor's Fellow at the Centre for Research in Digital Education and the Edinburgh Futures Institute at the University of Edinburgh. Alex Molnar is a Research Professor at the University of Colorado Boulder. Faith Boninger is NEPC's Publications Manager and Co-Director of NEPC's Commercialism in Education Research Unit and holds a PhD from Ohio State University. Williamson, B. Molnar, A., & Boninger, F. (2024). "Time for a pause: Without effective public oversight, AI in schools will do more harm than good." Boulder, CO: National Education Policy Center. http://nepc.colorado.edu/publication/ai) //Bellaire MC

AI in Education Since the 1960s, scientists and technology companies have explored ways to apply AI in education. AI in Education (AIED) is a major field of research and development.55 The AI applications being promoted to schools today were preceded in the 1960s and 1970s by "Intelligent Tutoring Systems" and "Computer Assisted Instruction" systems.56 Since the early 2000s, researchers have gathered, stored, and analyzed massive quantities of educational data with the intention of informing institutional and instructional strategies.57 These approaches are now routinely considered synonymous with AIED, and have also been rapidly commercialized by the ed tech industry.58 Most AIED applications employ big data and machine learning to produce various predictions and automated actions—such as predicting that a student may fail an assessment or creating a "personalized" intervention intended to produce a desired learning outcome.59 Research on AI in education has developed and tested various approaches and reported modest effectiveness on measurable learning achievement—performance on quizzes and tests, for example.60 Current excitement about its potential is motivating both public and private sources to generously fund researchers trying to find ways to improve learning outcomes using AI.61 However, the assumption that AI in education can be understood primarily as a technical matter best addressed by scientists and companies is increasingly challenged by researchers who argue that a narrowly technical perspective may lead to both bad policy and bad pedagogy.62 They point out that AI exists in social, economic, and political contexts that shape its development and uses.63 How AI is adopted by different educational stakeholders (including AIED researchers, ed tech entrepreneurs, corporate leaders, and policymakers) will have significant implications for its use in schools.64 The fact that entrepreneurs and corporations funded by venture capital and private equity are rushing to promote AI in education will inevitably narrow possible applications to those preferred by stakeholders with financial interests.65 Small-scale ed tech start-ups and Big Tech corporations alike see AI as an opportunity,66 leveraging popular hype to market such education products as personalized learning programs, automated lesson plan generators, and AI tutoring chatbots, called "tutorbots," to schools.67 Compelling evidence for the effectiveness of tutorbots in education remains scarce,68 though this does not prevent entrepreneurs and researchers from proclaiming their usefulness.69 Policymakers routinely invoke AI rhetorically, calling on schools to embark on "digital transformation,"70 often with little attention to social, economic, legal, or ethical

implications.71 These calls dovetail with existing political priorities on performance monitoring, account, ability, efficiency, and effectiveness—all of which require extensive collection of data about students.72 Although systems of test-

based accountability have existed in schools since the 1990s,73 they will expand and intensify as AI is used to continuously monitor and assess student learning.74 As a result, commercial AI systems will increasingly serve as private actors in public education as schools, districts, and governments relinquish key tasks, functions, and responsibilities to third-party technology vendors.75 Existing and potential uses of AI in education are not merely innovative technical add-ons to teaching and learning practices or engineering solutions to schools' existing pedagogic and administrative problems. Rather, AI in education has been spurred by multiple forces: longstanding efforts by scientists to measure, predict, and support learning processes and outcomes; commercial aspirations to profit from selling products to schools; and the political objective of being perceived as having improved school efficiency and accountability while cutting costs. As things currently stand, these ambitions have begun to coalesce into a vision of AI-driven schooling in which commercial products assess student learning, automate teaching, and make decisions about student progress. Inadequate Research Base¶ Despite the extensive research in the field of AI in Education (AIED) and the burgeoning¶ research on machine learning, there is **remarkably little** evidence to support claims of AI's ability to "transform" schools.76 While AIED researchers have produced many research findings, their studies tend to focus primarily on measures of individual student engagement and performance (assessed by standardized achievements tests), or on "engineering" problems such as designing increasingly sophisticated algorithms and enhancing machine learning effectiveness.77¶ Overall, AIED studies tend to find ambiguous results, lack independence and scale, and fail to address more fundamental questions **about educational goals**.78 AIED research therefore often promotes a view of education transformation as improving measurable individual outcomes despite very limited evidence that AI "works."79 In effect, such studies reduce well-researched and nuanced theories of how humans learn to whatever can be made into a mathematical model (however complex), and they ignore the contested terrain of exactly which goals and curriculum public schools should embrace.80 Moreover**, claims that** AI can solve major educational problems—such as lack of qualified teachers, student underachievement, and educational inequalities—rely to a considerable extent on **conjecture rather than** evidence.81¶ Even more problematic are the serious methodological flaws in machine learning research that call into question the validity of hundreds of studies.82 The nature of the flaws, in general, leads toward "over optimism" with respect to the usefulness and value of machine learning applications in a variety of fields.83 These findings are particularly concerning because they call into question not only commercial marketing claims, but also the scientific evidence base supporting the widespread implementation of AI systems in all sectors,84 including education. Finally, because of the very high computing costs associated with running machine learning models, most researchers have to rely on systems from the dominant AI companies themselves in order to conduct research85—the same corporations that often fund AI studies.86 This makes research dependent on corporate resources, funds, and business practices, giving AI firms considerable influence over not only AI development, but also the academic research that depends on their systems.87 It also compromises an important part of the research process, which is reproducing findings to verify their validity. When a company changes or stops supporting a particular model, researchers cannot reproduce studies conducted earlier.88 This renders the research base unstable and unverifiable—and thus unusable as a basis for assessing subsequent models.

Moreover, regulations have been overturned which opens the floodgates to waves of uncertainty

The American Civil Liberties Union finds in 2025

Amid the crush of executive orders and agency directives issued during Donald **Trump's first weeks** in office, his administration has begun to **demolish the foundations** for ensuring that artificial intelligence (AI) in the U.S. is safe and responsible. The president is not only set to completely roll back the fledgling protections Joe Biden's administration instituted, but also to further accelerate the **spread of unchecked AI** across American life. How is President Trump Dismantling AI Protections? President Trump has undone existing AI protections at a breathtaking pace. One of President Trump's first actions was repealing the Biden administration's Executive Order on Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence. That repeal also included instructions to review a presidential directive, known as a National Security Memo, governing national security use of AI. Days later, President Trump issued his own AI executive order, directing the Office of Management and Budget, which coordinates agencies across the federal government, to overhaul its existing directive on federal uses of AI. Federal agencies have followed the president's lead, **scrubbing websites of AI guidelines**, protections for jobseekers, and more. President Trump's goal is clear: undo anything that could get in the way of breakneck AI development and deployment. That **emphasis on speed is dangerous.** Artificial intelligence and other automated tools have already been rapidly adopted in the private and public sectors, without first ensuring that the tools are fair or appropriate. In the **absence of strong guardrails**, those tools are creating real-world harms when companies and government agencies use them to help decide who gets a job, who gets a loan, who goes to jail, and a host of other sensitive decisions. Why Are AI Safeguards Essential for Civil Rights and Public Safety? During the Biden administration, federal agencies began to develop guardrails to protect people when AI threatened their civil rights or safety. Those measures included critical protections for at least some of the federal government's uses of AI and commonsense guidance from agencies on steps the private sector should take to ensure that AI use complies with existing civil rights and other laws. But President Trump is already **rolling back** these modest measures with **little to replace** them. **This is a grave mistake**. Many of the Biden administration's directives were basic, common sense steps the government should take any time agencies are experimenting with and deploying a powerful new technology. These steps include robust **public transparency** and **internal oversight** (such as agency chief AI officers) as well as regular **testing requirements** to ensure that AI tools follow existing laws protecting civil rights and civil liberties, accurately perform the tasks they're given, and don't waste agency resources. There's no reason for the Trump administration to jettison those protections. Who Benefits from Rolling Back AI Regulations? Rolling back AI protections

signals the **pronounced power Big Tech has** in the new administration. This includes deploying AI to probe and slash critical government programs and grants. We are also seeing Tech's outsized influence in key personnel decisions and a new executive order that directs federal agencies to "integrate modern technology" into hiring and to "leverag[e] digital platforms to improve candidate engagement," which we fear is veiled language for the unproven products like gamified assessments, automated video interviews, and chatbots that technology vendors often try to sell with such claims. These technologies have been repeatedly demonstrated to <mark>lead to discriminatory harms, and</mark> many workers have reported that today's digital-application platforms are particularly confusing, inaccessible and opaque. Without safeguards, this influence will translate directly into real world harms. The Trump administration is primed to accelerate AI's development and deployment without critical guardrails to protect people from harm. **Supercharging AI deployment without guardrails will also supercharge the well-documented harms** that are already happening. That means more people are being denied jobs because AI ranked them lower than an equally qualified person. More people are also having their benefits cut or flagged for fraud based on erroneous or unfair AI determinations. We've also seen numerous instances where automated systems deployed in government contexts without

appropriate guardrails lead to **costly, inaccurate, and inefficient** outcomes for everyone -- achieving the **direct opposite** of the oft-stated goals of adopting AI in the first place. Common sense guardrails are not an impediment to AI innovation; they're necessary to ensure that innovation is making our lives better rather than worse. **Progress is about greater fairness**, safety, opportunity and convenience for everyone, **not <mark>worsen</mark>ing <mark>existing discrimination</mark>** and creating more roadblocks for underrepresented and marginalized people.

Our Sole Contention is Deception

First is leading the blind

Generative AI blurs the line between reality and fiction, turning misinformaiton into a commodity

With the advent of **generative artificial intelligence** (AI), the internet **has become a breeding ground for fake news and misinformation**. The phenomenon of **fake news and misinformation has had significant impacts across** various sectors, including the world of **finance and politics**. A notable example occurred in

mid-January 2023, when the spread of a false report stating that the SEC (U.S. Securities and Exchange Commission) had approved a spot-listed ETF (exchange-traded fund) caused volatility in Bitcoin prices [1]. In May 2023, an instance of generative AI being used to create a fictitious

image of a building near the Pentagon in Washington D.C. engulfed in black flames, leading to turmoil in the U.S. stock market [2]. Additionally, fabricated images of a former U.S. president being arrested and a fashionably dressed Pope in a white puffer coat were examples of fake news created using AI-generated fake photographs [3,4].

In the early days of the pandemic, misinformation about the source of the virus and its spread was prevalent due to the scarcity of information about COVID-19. Fake news exploiting medical professionals' expertise has also damaged medical institutions and professional organizations.

The public is bombarded with information from frequently unreliable sources. Misinformation is a powerful destructive force in this age of global communication.

to many vulnerable ears [5].

The ease of replicating and editing everything from a person's face to their voice with just a few clicks signifies a new era where the boundary between reality and virtuality is rapidly dissolving.

Regardless of the proposed Affirmative benefits, education districts are unprepared to readily implement AI

Klein 24 (Alyson Klein, A veteran education writer who has covered K-12 schools for more than a dozen years. She covers the latest developments in educational technology, including topics such personalized learning, data privacy, digital curricula, cybersecurity, and teacher professional development, "Schools Are Taking Too Long to Craft AI Policy. Why That's a Problem", Education Week, https://archive.vn/ywBeZ, 2-19-2024, DOA: 2-21-2025) //Bellaire MC

It's been more than a year since ChatGPT's ability to produce astonishingly humanlike writing sparked fundamental questions about the role of artificial intelligence in K-12 education.

Yet most school districts are still stuck in neutral, trying to figure out the way forward on issues such as plagiarism, data privacy, and ethical use of AI by students and educators.

More than three-quarters—79 percent—**of educators say their districts still do not have clear policies on** the use of **a**rtificial **i**ntelligence tools, according to an EdWeek Research Center survey of 924 educators conducted in November and December.

District leaders want to help schools chart the right course on the potentially game-changing technology, but many feel "overwhelmed and overloaded," said Bree Dusseault, a principal at and the managing director for the Center for Reinventing Public Education, a research organization at Arizona State University's Mary Lou Fulton Teacher's College, who has studied AI policymaking.

The lack of clear direction is especially problematic given that the majority of educators surveyed—56 percent—expect the use of AI tools to increase in their districts over the next year, according to the EdWeek Research Center survey.

And while experts are encouraging schools to teach their students to use AI appropriately, banning the tools for students is still a relatively common practice in K-12 education, the survey found.

One in 5 educators surveyed said that their district prohibits students from using generative AI, such as ChatGPT, although teachers are permitted to use it. Another 7 percent of educators said the tools were banned for everyone—including staff.

When district officials—and school principals—sidestep big questions about the proper use of AI, they are inviting confusion and inequity, said Pat Yongpradit, the chief academic officer for Code.Org and leader of Teach AI, an initiative aimed at helping K-12 schools use AI technology effectively.

"You can have, in the same school, a teacher allowing their 10th grade English class to use ChatGPT freely and getting into AI ethics issues and really preparing their students for a future in which AI will be part of any industry," Yongpradit said. "And then literally, right down the hall, you can have another teacher banning it totally, going back to pencil and paper writing because they don't trust their kids to not use ChatGPT. Same school, different 10th grade English class."

The new "digital divide will be an AI divide," Yongpradit said.

'Policy is always behind technology'

It's not hard to understand why most district leaders aren't eager to make big decisions about how their schools will use the technology.

Many educators worry that if students are exposed to generative AI, they'll employ it to cheat on assignments. Plus, AI tools can spit out false information and magnify racial and socioeconomic biases. AI also develops—some would say "gets smarter"—by consuming data, opening the doors for potential student-data-privacy nightmares.

The vast majority of educators don't have the capacity to cope with those complications on top of their other responsibilities, the survey found.

More than three quarters—78 percent—of educators surveyed said they don't have the time or bandwidth to teach students how to think about or use AI because they are tied up with academic challenges, social-emotional-learning, safety considerations, and other higher priorities.

What's more, **AI is changing so rapidly that any policy a district** or state **crafts could be outdated the moment it** is **released.**

That's typical when it comes to new technologies, said Kristina Ishmael, who until late last year served as the deputy director of the U.S. Department of Education's office of educational technology.

"Policy is always behind technology," said Ishmael, who is now a strategic advisor at Ishmael Consulting. In some cases, that's "very intentional, because it's policy; once you put it in, it's hard to take it off."

Teachers overestimate student's abilities to flag misinformation, which results in Generative AI leading blind and trusting students into falling for misinformation

Wineburg 24 [Wineburg, Sam, and Nadav Ziv. "What Makes Students (and the Rest of Us) Fall for AI Misinformation?." Education Week, Editorial Projects in Education, 25 Oct. 2024, www.edweek.org/technology/opinion-what-makes-students-and-the-rest-of-us-fall-for-ai-misinfo rmatio n/2024/10. Accessed 28 Feb. 2025.]

Four years ago during the 2020 election, we warned in the Los Angeles Times that ==young people== were ==struggling to spot disinformation because of outdated lessons on== navigating the internet. Today, educators risk making the same mistakes with ==artificial intelligence==. With the election at our doorstep, the stakes couldn't be higher.

Previous work by our research team, the Digital Inquiry Group (formerly the Stanford History Education Group), showed that ==young people are easily deceived because they judge online content by how it looks and sounds==. That's an even bigger problem with ==AI, which== ==makes information feel persuasive== even ==when it fabricates content== and ignores context.

what they see.

When it comes to AI, leaders preach "great excitement and appropriate caution," as Washington state Superintendent Chris Reykdal put it in a recent teachers' guide. He writes of a "full embrace of AI" that will put that state's public education system "at the forefront of innovation." New York City schools former chancellor, David C. Banks, who stepped down amid a federal investigation, said in September that AI can "dramatically

affect how we do school" for the better. The **"appropriate caution," however, remains a misty disclaimer.**

Washington state's guidelines, like California's, Oregon's, and North Carolina's, rightly warn that AI may be biased and inaccurate. Washington state stresses that students shouldn't automatically trust the responses of large language models and should "critically evaluate" responses for bias. But this is like urging students in driver's education to be cautious without teaching them that they need to signal and check blind spots before passing the car ahead of them.

This pattern repeats the mistakes we saw with instruction on spotting unreliable information online: **educators wrongly assuming**

that students can recognize danger and locate content that's reliable.

Massachusetts Institute of Technology professor Hal Abelson tells students that if they come across "something that sounds fishy," they should say, "Well, maybe it's not true." But students are in school precisely because they don't know a lot. They are in the least position to know if something sounds fishy.

Imagine a history student consulting an AI chatbot to probe the Battle of Lexington, as one of us recently tested. The large language model says this conflagration, which launched the American Revolution, was initiated "by an unknown British soldier." In truth, no one actually knows who fired first. The chatbot also reports that "two or three" British soldiers were killed during the skirmish. Wrong again. None was. Unless you're a history buff, this information doesn't sound "fishy."

A second danger is that **AI mimics the tone and cadence of human speech**, tapping into an aesthetic of authority. Presenting information with confidence is a trap, but an effective one: Our 2021 national study of 3,446 high school students reveals the extraordinary trust students place in information based on a website's superficial features.

When **students conflate style with substance and lack background knowledge**, the last thing they should do is try to

figure out if something "sounds fishy." Instead, the detection of unreliable information and responsible use of AI rests on internet search skills that enable them to fact-check.

Second is Spoon feeding

AI allows students to mindlessly ask for answers

Tyler **Pare 23** (Tyler Pare, "AI's arrival in education comes at an unfortunate time for students – New Hampshire Bulletin", New Hampshire Bulletin, 4-13-2023, https://newhampshirebulletin.com/2023/04/13/ais-arrival-in-education-comes-at-an-unfortunate-time-for-students/) // VP

ChatGPT prior to 2007, this argument might be more valid.

There is no shortage of articles about the benefits, concerns, and opportunities that artificial intelligence, or AI, presents to the future of civilization. Just perform a simple Google search or soon ask Bard to examine the vast array of articles and studies detailing how AI might

impact the future of any given subject. After examining these articles, one could conclude that from its ability as an unparalleled work multiplier to its

ability to create and edit lines of code, **AI is here to stay** – and it is not just a passing technological wonder like LaserDisc or Betamax. In terms of its historical significance, **the eagerness to incorporate AI** across a variety of industries is **akin to the printing of the Gutenberg Bible.** However, unlike the printing press, which ushered in the era of movable type and concordantly the growth of independent, critical thought, <mark>**AI represents a direct threat to thought**</mark>, especially because of its historical timing. Journalist Johann Hari recently published a book titled "Stolen Focus" in which he argues that **the engrossing use of social media**, especially by younger generations, has resulted in the inability of students to sustain deep focus on complex topics. As a result of growing up in an era where they are constantly distracted by screens, <mark>**students have experienced a steep decline in critical reasoning**</mark> **and writing skills**, both of which take a considerable amount of sustained focus to learn how to develop. It is

easy to place the blame for this decline at the feet of the COVID-19 pandemic and remote learning. However, most teachers would agree that

student ability to critically reason and write were on the decline prior to 2019, and that the pandemic

merely exacerbated these issues because of how much teachers needed to rely on technology to teach students. Consider the results of the National Assessment for Education Progress test in both math and reading. The achievement results in both of these categories have been relatively flat or in decline since 2008. This decline coupled with the use of distance learning technology during the pandemic unintentionally enabled the negative habits of social media and smartphones to go from a slow trickle into the classroom to a torrent of obstacles at the center

of the learning process. It is **in the wake of this erosion of student focus** that **AI finds the ideal preconditions for rapid uptake**, legitimacy, and use by students **to fill the vacuum where critical reasoning** and writing skills **used to be for previous generations**. From this moment forward, **AI will establish a**

watershed of new learning modalities for education, except unlike past modalities which have enabled students

to develop critical reasoning and writing skills, **AI will ultimately do the reasoning** and writing **for them.** ==**AI will wrest control of critical thinking from generations of learners and cement itself as a homogenized arbiter of thought.**== In this scenario, ==**students will be robbed of the basic purpose of education by becoming unflinching functionaries of an algorithm.**== Some educators look at the dawn of

generative AI as a new tool for learning that will do for writing and thinking what the calculator did and does for math. This argument for the blanket use of AI in education fundamentally misunderstands the historical timing of AI. If AI came into existence with the abilities of Bard or **independent critical reasoning** and writing skills **before** they interacted with **AI**. Such interactions could have been used to supplement and broaden these independently cultivated skills. It is easy to get lost in alarmism when new technologies replace old modes of thinking and doing. Even Socrates thought that the invention of writing would destroy thinking because it would lead to everyone forgetting what they had written down because they did not have to remember their thoughts. Socrates was wrong about the impact that writing would have on thinking. Historically, the written word had proven to be the single most powerful transmitter of knowledge and has led to the proliferation of human ingenuity. While the example of Socrates illustrates the unfounded anxiety many have felt when new technologies emerge, it is a straw man understanding of the nuanced perpetual threat that AI presents to independent, critical thought. Presently, generative

AI is in its least capable form. Therefore, **the argument that "AI cannot do x,y, and z" is moot. GPT-4 is already passing medical exams. What will it be capable of in 10 years?** Are we looking at a future where

students are incapable of discerning the difference between information and disinformation because they have relied on an AI to evaluate evidence for them? It is not alarmist to postulate a near future where this is the norm for students, especially since most of them have had their ability to sustain focus torn away by social media. New Hampshire Teacher of the Year finalist Jennifer MacLeod recently remarked that

==**education is approaching "dark days" with the onset of generative AI within the classroom.**==

These days may come, and educators need to learn to live and teach with generative AI as another tool in their toolboxes. However, learning to live with generative AI will establish a paradigm shift in education and how students learn to think, and it might not be for the better.

to teach students how to be great editors of AI-written content,

Thus, AI has spoonfed answers

Curtis **Heinzl 23** (Curtis Heinzl, "ChatGPT can hinder students' critical thinking skills", Queen's Journal, 3-17-2023, https://www.queensjournal.ca/chatgpt-can-hinder-students-critical-thinking-skills/) // VP

The bigger concern is the impact the AI will have on removing the need for students to develop foundational learning skills early in their academic careers. **Critical thinking is one foundational skill students must develop during their time** Almost every student must write essays of various forms that gradually become more difficult throughout primary and secondary school. Essays are a useful educational tool because they promote and force students to think critically. **Not only is the student consuming information, ideas, and creating different arguments, but they're also reflecting on this work** and internally synthesizing the content to draw conclusions. ==**ChatGPT**== will significantly impact how essays are written. It ==**possesses the ability to instantly generate coherent essays**== **on whatever topic** **the user asks it to write.** When I asked the chatbot to write an essay on the NHL's original six teams, it took all of 15 seconds for it to write me an essay on the correct subject with a proper introduction, a narrative, and a well-structured conclusion—no critical thinking required. Admittedly, it's unlikely most students would simply copy and paste an AI-written essay. **Most users will edit** and tweak the essay, a process which requires thought and a synthesis of information. Therefore, ChatGPT could be viewed as harmless only at the start of a writing assignment. This would allow students to get the lay of the land on their topic and then proceed to editing. Perhaps more AI generated writing will teach this generation of students how to be great editors. Yet, despite the potential **students cannot simply rely on editing as the main form of their writing.** ==**Students would not be learning to use their own words to express thought, only the words of AI.**== There's an element of flexibility and creativity that come with using your own words to express your thoughts and ideas. ==**Taking that away from students at such a critical stage in their learning development will hinder their ability to creatively express themselves.**== When ChatGPT can instantly comb through vast amounts of Internet data and decide what to present to a student, it eliminates another form of critical thinking: judgement. **We**

shouldn't have students develop a dependence on AI to filter out the information clutter in their lives. In the digital age where students are surrounded by an information overload, **being able to** ==**critically**== ==**evaluate different sources of information**== **is more important than ever before.** There's significant value to be had in learning to comb through different sources of information when scrutinizing what can or can't be used to support an argument in an essay or paper. Writing teaches primary and secondary school students how to communicate in an efficient manner. This is a skill required of students throughout their entire academic career, including post-secondary education. If a student completes the bulk of their writing assignments using AI, they will severely stunt the growth of their communication skills. **There's also inherent value in the process of learning to write**

itself. Learning to write and seeing improvements motivates students to try new things and understand the value of education. **When the writing process becomes inputting a prompt into ChatGPT to get their desired outcome, the jump from point A to point B leaves no room for learning.** Using **ChatGPT** to **circumvent[s] the learning process gives students little incentive to change anything about** their writing or **the way they learn.** Primary and secondary schools should strive to instill a love of learning in their students and provide them with opportunities to find their unique intrinsic motivation to continue learning.

Critical thinking is required for innovation.

Siljeg 22 [Siljeg, Anthony. "In Today's Often Changing World, Innovation, Critical Thinking, and Design Thinking Are Excellent Skills and Techniques for Creative Ways of Developing Ideas. To Be Truly Innovative, One Needs to See Things from a Different Perspective and Have Some Boldness to Try Something New." Linkedin.com, LinkedIn, 9 Sept. 2022, www.linkedin.com/pulse/innovation-collide-between-anthony-siljeg/. Accessed 28 Feb. 2025.]

==**Critical thinking is essential for Innovation**==, **where we uncover our own paths** and judge others' paths less. ==**The ability to question assumptions**==, think independently, and ==**identify flaws in logic is vital for**== **generating new ideas and** ==**solving**== **easier** ==**complex problems**==. **Without critical thinking, we**

==**would be stuck with the status quo**==, **unable to improve upon existing products, services, and**

==**systems**==. Unfortunately, critical thinking is often misunderstood in society. Too often, **we are quick to judge and criticize**

others without pausing to consider their point of view or the merits of their arguments. We

create a more tolerant and innovative culture by promoting critical thinking when it is more indirect, even (lateral thinking) toward others and overseeing a new version or outcome we have for ourselves (critical thinking) and when giving feedback. How do we direct more creativity and unstifled Innovation? In order to be innovative, first, we need to understand the creative process and how it can be applied to come up with new ideas. The creative process involves four main steps: ideation, incubation, confirmation, and implementation. Ideation is the generation of new ideas, incubation is the development of those ideas, confirmation is testing whether or not the ideas are feasible, and implementation is

putting the ideas into practice. Pursuing inventiveness is by following these steps as a means to seek opportunities.

C2 is racial bias

AI in education reinforces bias that plague our society

Rob **Monahan** **24**, PhD at North Carolina State University and founder of STEM Passport, 7-1-2024, North Carolina State University, "Fostering Epistemic Agency: Strategies for Mitigating Implicit Bias in AI-Enhanced Education", LearnTechLib, https://www.learntechlib.org/primary/p/224622/, Accessed 2-17-2025

Concerns around AI use are justifiably amplified when the known issue of implicit bias in AI outputs is factored in (Nelson, 2019; Ntoutsi et al., 2020; Rejmaniak, 2021). As AI programs such as generative AI models (e.g., ChatGPT and Dall-E) increasingly become recognized as essential tools for students to learn and master, **it is crucial to understand the potential impact of their inherent biases on various measures related to students** (Perrigo, 2022). Calaza et al. (2021) highlight the role of implicit bias in perpetuating racism and sexism in science, emphasizing the real-world consequences of biased AI-generated content. Similarly, Eaton et al. (2020) **demonstrate how implicit biases related to gender and race/ethnicity contribute to disparities and inequalities in society**, further reinforcing the argument that AI bias can have significant negative outcomes for students. These implicit biases live within AI databases and contribute to creating feelings of othering and a low sense of belonging, worsened by repeated exposure to implicit biases, such as the underrepresentation of minorities and women in Science, Technology, Engineering, and Mathematics (STEM) fields, and in AI representations of STEM professionals -1011- EdMedia 2024 - Brussels, Belgium, July 1-5, 2024 (Weddle, 2017). **Othering, or the sense of being excluded, can have profound negative consequences on an individual's identity formation, self-concept, self-efficacy, and confidence**, leading to demotivation or amotivation when it comes to engaging in STEM-related activities (Banerjee, 2021). **These biases in AI tools when unregulated may significantly impact students' development of their epistemic agency.** It is essential to equip students with the skills needed to critically analyze AI-generated content and to understand the underlying mechanisms that may perpetuate biases on a technical level (Hao, 2019). The ethical implications of AI biases in the context of othering are profound. Addressing these biases is a moral imperative to promote inclusivity and equity in places like STEM education environments, ensuring that AI tools serve as bridges rather than barriers to understanding (Benjamin, 2019). The link between epistemic agency, AI biases, and identity formation lies in the processes that determine how learners come to see themselves as knowers and contributors to the knowledge community. Students who exercise epistemic agency essentially craft a "learner identity" informed by their own constructed beliefs, values, and understandings. This self-conception as an

active participant in the learning process is a critical part of their academic identity and, by extension, their broader personal identity (Scardamalia & Bereiter, 2006). A looming question is the degree to which AI tools have the potential to influence a learner's beliefs, values and understandings, and by extension, their identity formation. By exploring the intersection of expectancy value theory (EVT), self determination theory (SDT), and social identity theory (SIT) within the context of AI bias, this paper aims to provide evidence of the importance of helping students develop a critical lens through which to view AI with informed skepticism rather than blind trust. Both educators and researchers work to ensure that students can distinguish information from knowledge, and knowledge from wisdom. More specifically, this paper aims to raise questions and suggest future research directions regarding the affective, behavioral and cognitive (direct and indirect) effects of AI tool use on students, paying close attention to the impact of implicit bias known to be present in generative AI systems. Frameworks Systems theory acts as the foundational framework for this theoretical article. Traditionally, it has acted as a frame for the inquiry process used by researchers attempting to understand scientific and social problems holistically. Systems theory also speaks to "a constant yearning for understanding the wholeness of the human experience" throughout human history (Banathy & Jenlink, 2004, p. 40). Rather than breaking problems down into parts and trying to solve them in segments, a systems theory approach calls for a focus on the interactions between pieces. This study looks at the overlap between multiple theories and the collective effect of their interactions on students in the context of AI adoption in education settings. The intersection of Social Identity Framework (Tajfel & Turner, 1979), self-determination theory (SDT) (Deci & Ryan, 2000), and expectancy-value theory (EVT) (Eccles & Wigfield, 2002) allows for comprehensive exploration of student-centered effects, examining how exposure to AIgenerated biases may affect student inclusion and exclusion, ultimately influencing their identity and self-concept (see Fig. 1 and Tab. 1). Figure 1. AI-Bias Effect Model -1012- EdMedia 2024 - Brussels, Belgium, July 1-5, 2024 Table 1 Framework: AI-Bias Effect Model Note**. This study is grounded in the premise that generative AI programs can inadvertently amplify implicit bias (**particularly gender and racial bias) in AI-generated content, which may impact affective, behavioral, and cognitive dispositions of users, potentially leading to identity conflict in digital spaces. To understand these relationships, the theoretical framework integrates elements from social identity theory, expectancy-value theory, self-determination theory, and recent insights into machine learning feedback loops and digital identity formation. -1013- EdMedia 2024 - Brussels, Belgium, July 1-5, 2024 Positionality A person's thoughts and social interactions are influenced by their estimation of how they perceive themself, how they think they are perceived by others, as well as their

beliefs about others (Fiske and Taylor, 2013). These social interactions and the expression of our thoughts and beliefs can occur in both physical and digital environments. A person's beliefs may include stereotypes and biases (both implicit and explicit), which may lead to inaccurate assessments and judgments of themself and others in a variety of contexts. **For example, research has shown that biases related to gender and race/ethnicity are powerful forces** that "foster the disparities and inequalities found in our society" (Calaza et al., 2021), particularly in STEM fields (Cech & Blair-Loy, 2019). Artificial intelligence is situated at the intersection of two opposing outcomes: amplifying existing biases and offering a new lens for epistemic insight. **The algorithms that drive AI are a reflection of the prejudices of the data they are provided, thus enabling potential to reinforce and perpetuate stereotypes** (O'Neil, 2016). AI also holds the promise of breaking barriers and exceeding human limitations in ways that can enrich our collective understanding of knowledge itself (Zawacki-Richter et al., 2019). Within the theoretical constructs of SIT, EVT, and SDT, we must embed a critical epistemic stance towards AI. Educators play a pivotal role in this process, guiding students to question and evaluate AI-generated content critically while fostering their development as epistemic agents capable of developing their digital and physical identities with autonomy and insight. Literature Review Identification of Research Gaps Based on a literature review conducted on AI bias and implicit bias, several blindspots and gaps in the current research have been identified. First, there is limited understanding of the relationship between AI bias and variables such as motivation, engagement and performance, particularly in educational settings. Some studies have explored the existence and consequences of AI bias, but the potential direct and indirect effects of AI bias on factors that contribute to students' self concept and sense of identity remains largely unexplored. Second, the contextspecific impacts of AI bias warrant additional research. Most existing studies on AI bias focus on generalized population-level implications or on specific parts of industries, such as hiring practices. The takeaway is that there is a need for more context-specific research that investigates the impact of AI bias in various settings, such as education and AI tutoring systems. Lastly, there is a need for greater intersectionality in AI bias research. The literature on AI bias often examines the impacts on specific demographic groups independently, but the investigation of how different social identities intersect and influence the experience of AI bias and its effects on students is still lacking. By addressing these gaps, future research can provide a more comprehensive understanding of the complex relationship between AI bias and user motivation. Historical Context On November 30th, 2022, a company named OpenAI released a program to the public called ChatGPT, which has been measured by technology adoption metrics as the fastest consumer application platform to hit the one million user (reached in 5 days), and 100 million user (reached in 2 months) marks (Jayanti, 2023). For comparison, this means that AI use is ballooning more rapidly than any other technology product released in history, including Instagram, Facebook, TikTok, Dropbox, Spotify, Google, and Netflix. Additionally, the recursive formula for the development and release of subsequent iterations has been considerably faster than other popular technological innovations. This progression underscores the need to thoughtfully and strategically research the implications of AI use within the scope of educational technology and its potential to

transform teaching and learning processes. It is crucial to be prepared for rapid AI sector development and growth despite the theoretical risks and adverse effects of AI biases on students' motivation, self-concept, identity formation, and overall well-being (Crawford & Paglen, 2019; Lupton, 2014). AI Bias and Implicit Bias The rapid growth of AI applications, such as ChatGPT and Dall-E, have raised concerns regarding the potential for bias in these systems. **Research has demonstrated that AI systems may inadvertently perpetuate and amplify societal biases, including gender and racial biases** (Caliskan et al., 2017; Garg et al., 2018). **Implicit biases, which are unconscious attitudes and stereotypes, influence human behavior and decision-making without conscious awareness**, which **influences perceptions, judgments, and actions toward others** (Greenwald & Banaji, 1995; Greenwald & Krieger, 2006). AI systems are trained on large datasets containing biased information that can inadvertently learn these biases and reproduce them in their outputs (Bolukbasi et al., 2016) These biases are rooted -1014- EdMedia 2024 - Brussels, Belgium, July 1-5, 2024 in societal norms, culture, and personal experiences, and may not align with an individual's explicit beliefs or values. Implicit bias can lead to discriminatory behaviors, even when individuals are not consciously aware of their biases. **Recent studies in educational technology have only just begun to investigate the specific mechanisms by which AI bias** affects **student engagement and learning outcomes** (Berkman Klein Center for Internet & Society at Harvard University, 2023). Generative AI models, developed through machine learning using human-created databases, inherently mirror the biases and prejudices present in society (Caliskan et al., 2017). **AI biases may arise when training data overrepresents specific racial or ethnic groups, leading to distorted or unfair portrayals** (Buolamwini & Gebru, 2018). Biased AI algorithms can result in unjust treatment and discrimination against particular individuals or groups, affecting their self-esteem, self-concept, identity, and confidence, which, in turn, influences their motivation and behavior. Investigating the social implications of AI biases is vital for informing AI developers on how to address and minimize such biases. By **creating more inclusive AI systems and educational environments, educators can promote motivation, engagement, and academic success for all students** (Baumeister & Leary, 1995). Othering Belonging, Inclusion, and Their Effects on Students The expression of implicit biases may have a number of maladaptive effects on groups and individuals, **including the development of a proclivity towards demotivated psychological states** brought on by a phenomenon known as "othering" (Canales, 2000). Othering is a phenomenon in which some individuals or groups are "defined and labeled as not fitting in within the norms of a social group" (Canales, 2000). There are exclusionary and inclusionary elements of othering that influence how people perceive and treat each other (Canales, 2000). **Otherness as a concept has been used to describe the way individuals with minority identities feel**

in relation to those with majority identities, as it "privileges those with the power to construct and categorize the identity of those with unequal power" (Weddle, 2017). A sense of belonging, characterized by connection, acceptance, and inclusion to a group or community, is essential for motivation and well-being (Baumeister & Leary, 1995; Gray et al., 2018; Walton & Cohen, 2011). Depending on how it is used, AI has the capacity to perpetuate feelings of othering or help dismantle them. This **may also come down to how the AI industry and third-party industries leveraging AI technology decide to move forward** with the development of future iterations. As AI systems become more prevalent in educational settings, there is a growing concern that the **biases present in these systems may disproportionately exacerbate feelings of othering among marginalized student populations**. Existing literature on othering suggests that students who feel excluded, isolated, or marginalized may experience lower levels of motivation, engagement, and academic achievement (DeCuir-Gunby & Schutz, 2014). Further, SIT suggests that individuals derive their self-concept from their membership in social groups. **AI biases may threaten users' social identities, contribute to feelings of marginalization**, and in turn, negatively affect their motivation and engagement.

Digital Othering The implicit biases that exist in AI tools and programs are a reflection of societal prejudices that have been shown to influence the learning experience and self-perception of students (Steele & Aronson, 1995; Riegle-Crumb & Humphries, 2012; Sue, 2010), ultimately leading to a phenomenon that we will refer to as 'digital othering'. It speaks to the experiences of students who, while interacting in an online learning environment, may increasingly encounter biases induced by or related to AI, that challenge their social identity and sense of belonging. One implication is that the role of AI in education is not merely a technological concern but a sociological one, blending the fields of Digital Sociology and Identity Studies. We believe there is enough evidence in the literature to recommend interrogating how digital spaces are structured and mediated by AI and how they might replicate or disrupt societal norms, as well as refining and updating algorithms.

Eliminating racial bias in education is crucial to ensure equality

ACLU 23 [ACLU, "Why Access to Education is Key to Systemic Equality", September 06, 2023, American Civil Liberties Union, https://www.aclu.org/news/racial-justice/why-access-to-education-is-key-to-systemic-equality, Accessed March 01, 2025] WB-RPF

All students have a right to an equal education, but students of color — particularly Black and Brown students and students with disabilities, have historically been marginalized and criminalized by the public school system. The ACLU has been working to challenge unconstitutional disciplinary policies in schools, combat classroom censorship efforts that disproportionately impact marginalized students, and support race conscious admission policies to increase access to higher education. Let's break down why education equity is critical to the fight for systemic equality. What does "education equity" mean, and why is it a civil rights issue? Education equity means all students have equal access to a high quality education, safe learning environment, and a diverse student body that enriches the educational experiences of all students. As the Supreme Court said in Brown v. Board of Education, education "is the very foundation of good citizenship." Through education, young people learn important values about our culture and democratic society, and about their own values and relationships to others in this society. In addition to being an important foundation for kids' and young adults' future professional success, ==education allows individuals to be informed== voters and ==participants in democratic processes, and public education is the first experience== most people will have with the government. For all of these reasons, ==equity in education is a== critical ==foundation for a== democratic ==society in which== people of ==all backgrounds are== ==equal==ly included. Without equal opportunities to obtain an education, they will not be able to participate equally in jobs, in voting, and in other crucial areas of life. And when students are not able to learn together, this harms their ability to work together and live and engage with one another later in life. What was the foundational Supreme Court case aimed at addressing discrimination in education nationwide? Modern understandings of educational equity have their roots in Brown v. Board of Education, the 1954 landmark Supreme Court decision that ordered an end to school segregation and held racial segregation in education violates the Equal Protection Clause of the constitution. The ACLU played an important role in the Brown litigation, and has continued to fight for education equity on many fronts in the decades since. What is the "school-to-prison pipeline"? **The school-to-prison pipeline refers to school discipline practices, such as suspensions and referrals to law enforcement, that funnel youth out of the classroom and into the juvenile and criminal legal systems. This trend reflects our country's prioritization of incarceration over education, and it's made worse as resources for public schools are cut. From inadequate resources for counseling to an overreliance on school-based police officers to enforce harsh zero-tolerance policies, many students — overwhelmingly students of color and students with disabilities — are isolated, punished, and pushed out of our education system for typical childish behavior and behaviors associated with disabilities. Even a single suspension or disciplinary infraction can have enormous**

consequences for a child's education. As a student is pushed further down the school-to-prison pipeline, those consequences escalate quickly. In some

jurisdictions, students who have been suspended or expelled have no right to an education at all. In others, they are sent to disciplinary alternative schools. Youth who become involved in the juvenile system are often denied procedural protections in the courts, and students pushed along the pipeline find themselves in juvenile detention facilities, many of which provide few, if any, educational services.