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**You should be skeptical of AI’s effectiveness**

**Williamson** **‘24 finds** (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)

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 education**al 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. 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.

**Even if AI is good in theory, a lack of district policies and teacher education means AI is implemented poorly**

**Klein 24 states** [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), Without AI Literacy, Students Will Be ‘Unprepared For The Future,’ Educators Say, 12-18-2024, Education Week, https://archive.vn/EfRKt] accessed 2-20-2025 //

**Schools need clearer policies** and better practices **for AI** use Educators should steer away from being “reactive” toward AI and instead “focus on that proactive side of building up the literacy skills, so that they can use those to benefit their social, emotional wellness, their overall well-being, and their ability to be critical thinkers,” Gallagher said. But that is easier said than done in K-12 schools. To begin with, **more than three-quarters of** educators reported that their **districts did not have clear policies on the use of AI for education**, according to an EdWeek Research Center survey conducted a year ago. **Without clear policies in place, educators will struggle to determine how to integrate the tech**nology into instruction and the management of schools.

**Thus, Westborough negates.**

**Our First Contention is Cost.**

#### **AI systems take money from poor districts.**

**Williamson et. al 24 warns** (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>)

Dangers in Administration¶ Increased Costs¶ **Learning** management **systems already used in many schools,** such as Google Classroom, Blackboard, and Canvas, are beginning to integrate AI into their platforms.150 Google Classroom, with its suite of nominally “free” software and low-cost Chromebook hardware, dominates the market.151 It has already announced the launch of AI-based adaptive learning addons to Classroom, with associated additional costs for schools, as well as plans to upgrade Classroom further with generative language AI. “Practice Sets” is Google’s AI-based adaptive learning system for education, and “Duet AI” is its “collaboration partner” for teachers.153 In addition to any pedagogical implications associated with using Google Classroom,¶ **its integration** of further AI and automation into many aspects of school functioning also¶ carries potentially significant administrative implications.154¶ The most significant of these is to **obscure[s]** the **rationale for administrative decisions about critical institutional issues** when decision-making is ceded to opaque machine learning systems controlled by tech firms. Google Classroom, for example, integrates with hundreds of¶ other ed tech products and can synchronize with a school’s student information systems. It offers Google cloud services such as single sign-on, identity management, and device management, as well as plagiarism detection, automated grading, teaching templates, student grouping, and administrative analytics to facilitate “data-driven decisions.”156 Such management systems facilitate the transfer of control of schools from the public to private corporations by acting as central conduits through which all of a school’s digital activities must pass—making it hard for educators or administrators to see how any decisions based on the¶ data have been made.157¶ Because **running AI is costly, the use of AI programs in schools will** necessarily **require schools to pay for operating costs for an increasing number of** pedagogic and **administrative AI applications**. The **promise that AI can save schools money by reducing staffing costs is** likely **illusory, as schools will** probably be required to **pay costly fees for accessing AI facilities.** In other words, **rather than saving money, administrative app**lication**s are more likely to shift existing funds to monopolistic technology providers.**¶ Khanmigo and Google Classroom already illustrate how this works. Khan Academy, when it¶ provides Khanmigo to districts, currently charges those districts $60 per student for annual use, citing high computing costs associated with OpenAI’s GPT-4 as the justification for the charges.158 Likewise, districts must also pay for Google Classroom’s AI upgrades. To access¶ its latest adaptive learning application, Practice Sets, they must switch from the free basic¶ offering to a for-fee premium package.159 In other words, **tech firms are extracting value from school budgets to defray the high computing costs associated with AI (and grow company value).**

Increased Threats to Student Privacy¶ AI applications collect and aggregate data in order to function. In so doing, they normalize digital surveillance and privacy invasions in school.161 In practice, education technology¶ companies use applications like Google Classroom to routinely collect as much data as possible, well beyond that required to perform their assigned tasks.162¶ Although proponents of using AI in education tend to emphasize the efficiency of data-driven¶ administrative systems, privacy-related threats to equity are inherent in it.163 This is because¶ AI models are built using massive data sets that can be used to profile, compare, and assess¶ individuals who are then subject to potentially discriminatory decisions based on “statistical¶ dossiers” of their personal lives.164 Thus, a significant danger of digital technology in general,¶ and of the privacy-invasive model of AI in particular, is that they can reproduce and amplify¶ existing forms of inequality in education by using datasets containing examples of historic¶ bias and discrimination.165 For example, if a big data set indicates that certain marginalized¶ groups have underperformed historically, then a software application may be biased against¶ individuals from such groups in the future, singling out and targeting them as “at-risk” and¶ closing down or limiting their opportunities to access information and resources.166¶ Moreover, school data systems are vulnerable to breaches, hacks, ransomware, and denial-of-service attacks.167 A data breach at the student-tracking ed tech company Illuminate,¶ for example, compromised the educational data of at least a million public school students¶ and prompted New York City’s Department of Education to ask schools to stop using Illuminate’s products.168 School data systems feature highly detailed and intimate student¶ information, including personal and demographic data, grades, attendance, behavioral information, and other confidential information. Increasing AI capacity in ed tech products¶ may exacerbate these vulnerabilities, as student data are collected at even greater scale by a¶ wide range of companies—including AI companies—that offer only vague data privacy protections.169 Reduced Transparency and Accountability¶ Finally, enabling AI to play a role in school administration will reduce the transparency and¶ accountability of decision-making.170 Many digital products already used in schools are neither transparent nor accountable because current law and regulation allows companies to¶ shield the inner working of their products behind proprietary protections.171¶ AI is even more opaque than other digital programs.172 Black box machine learning and AI¶ models are so complicated that their outputs are often impossible to explain or interpret.173¶ Although in many cases simpler and more accessible statistical models can produce equally accurate results, companies benefit from selling access to proprietary models that require¶ customers to trust the systems and simply accept being unable to verify results.174 If the¶ system makes a mistake, it might never be identified or redressed and the public suffers the¶ consequences. For example, the facial identification systems used for remote testing often¶ fail to accurately identify individuals or mistakenly flag student behaviors as suspicious, but¶ they are very hard for students to challenge.175¶ In high-stakes decision-making in a sector like education, allowing such impenetrable models to assume responsibility for key administrative procedures necessarily means the creation of schools in which school leaders and teachers will be unable to exercise judgment,¶ provide a rationale, or take responsibility for classroom and institutional decisions.176¶ Considerations for the Future¶ Is AI Development Responsible?

The rapid creation of AI applications for schools raises the urgency of prioritizing ethics,¶ student rights, and social responsibility in their development.177 Responsible AI development would ensure that products are safe and trustworthy, designed to benefit people, communities, and society, and mitigate harms.178 As yet, there is little indication that such values are adequately addressed in education applications.179 Unfortunately, academic AIED¶ researchers have tended to ignore them or delegate addressing them to the educational tech¶ industry and policy centers.180 **This** complacency—along with the money and power held by commercial actors—**enables commercial rather than educational imperatives to guide** the development of **AI and** furthers political interests promoting relentless testing and school¶ surveillance.181¶ Responsible governance would require the companies developing AI to commit to transparent and responsible product design, and also to monitoring, understanding, and mitigating¶ the continuous impacts of AI in various contexts. Of particular concern is the automation¶ of decisions with “irreversible and severe consequences.”182 For example, technologies to¶ identify emotions are currently being developed to assess if a person is lying and cheating.183¶ These technologies are inherently inaccurate, however, and an inaccurate judgment that a¶ student has cheated or that a witness is lying could have dire consequences for their lives.¶ Responsible AI governance might lead to delaying or indefinitely pausing development of¶ such technologies.¶ Although several responsible AI initiatives have produced principles, frameworks or checklists for safe and trustworthy AI development and accountability,184 these agendas can be¶ manipulated through various forms of industry lobbying and efforts to water down their¶ scope or possibilities of enforcement.185 Expanding responsibility for product safety to include the wide range of people or organizations that build and use AI—rather than leaving it¶ to technicians and business alone—would mitigate such dangers.186¶ Among the many obstacles to the implementation of responsible policies governing AI is¶ their cost. **The goal of** profit-seeking **business is to shift to the public as many costs as possible** while garnering the highest possible private rate of Return On Investments. Public oversight of AI necessarily entails either public ownership or a comprehensive regulatory regime¶ adequately financed to achieve its mission. The question is, where will the money come¶ from?¶ Moreover, the required regulation flies in the face of 50 years of policy devoted to deregulation and privatization. It would demand a fundamental rethinking of the government’s¶ relationship to commercial interests. Such rethinking would, without a doubt, be attacked¶ by self-interested parties as not only too costly but also as stifling innovation and promoting¶ inefficiency. While these arguments may be relevant in individual circumstances, they are¶ neither generally nor self-evidently true.¶ From the perspective of education, responsible governance of AI therefore entails significantly more commitment than the simple principles of responsible development issued by¶ industry. It also requires costly and ongoing monitoring of the effects of AI in classroom¶ contexts. It may also require delays and indefinite pauses in development where warranted—such as, for example, in cases where commercial AI providers seek to introduce products into schools with insufficient evidence that they produce beneficial outcomes, or when¶ those products automate professional judgement with potentially negative consequences, or¶ when they inadequately address questions of AI ethics directly relevant to education.¶ Is AI Inevitable?¶ AI products are moving into schools at dizzying speed. As we have noted, this is in part the¶ result of the pressure on schools to “modernize” by adopting the latest products that the¶ technology industry offers. There is already a consensus of sorts that the move to AI is inevitable. The director of educational technology at Newark Public Schools made the case to the¶ New York Times when he explained why his district adopted Khanmigo: “It’s important to¶ introduce our students to it, because it’s not going away.”187¶ The de facto requirement that students serve as a technology company’s experimental subjects might be explained by the initially low entry cost for school districts. **Struggling districts, especially, might be willing to gamble that a technological innovation might turn things around for their students.** However, before placing that bet it would be valuable to¶ first ask some fundamental questions.

**Teacher salaries are severely undercut.**

**Lincoln ‘25 reports**, Lincoln, Martha, and Martha Kenney. “CSU Says Its AI University Is Good for Higher Education. But Is It?” San Francisco Chronicle, 13 Feb. 2025, www.sfchronicle.com/opinion/openforum/article/csu-ai-university-education-20158671.php

The details of the AI university are murky. It is not clear how artificial intelligence will be integrated into classrooms, monitored or evaluated. The mission of CSU’s new AI Workforce Acceleration Board is also thinly described: Though the program aims to create “a pipeline of AI-skilled graduates” and provide internship opportunities to CSU students, no specific metrics or benchmarks are stated. The board is composed solely of officers at technology corporations; it does not, thus far, include roles for students or faculty to provide input. Another unknown is how much the CSU administration will spend on this program. **A** recent report suggests that the **18-month contract to provide ChatGPT to faculty, staff and students will cost almost $17 million.** Yet the system also faces proposed budget cuts of almost $400 million **and has laid off faculty and staff on multiple campuses this year.** At this moment of crisis in the CSU system, **it is important to ask whether investment in AI is more important than investment in people.** It is conceivable that **AI will replace faculty and staff** — including advisers, tutors and counselors who provide critical services to CSU students. Even in the absence of these details, it is not clear that generative AI tools will benefit CSU students significantly or help faculty serve them more effectively. The abilities of generative artificial intelligence are routinely overstated — a phenomenon that computer scientists Arvind Narayanan and Sayash Kapoor describe as “AI snake oil.” While generative AI can create what one group of authors has dubbed “reliable sounding language,” it is not capable of independently evaluating the truth or ethical content of a claim. Beyond being overhyped, artificial intelligence applications can also be [is] prone to errors. AI tools predictably “hallucinate”— generating outputs that are untrue and fabricated and even, in some cases, violent or racist. Further, generative AI is widely associated with dishonesty, cheating and fraud. Its model for text generation, dependent on web scraping, is intrinsically disrespectful of intellectual property rights. OpenAI — one of the companies participating in the CSU partnership — was sued by the New York Times over the unauthorized use of news articles as training data. A new report shows that Meta pirated millions of books to train its large language model Llama. (Meta has claimed this was fair use.) Generative AI is a particularly poor fit for university settings, where we teach students foundational skills like reading, writing and critical thinking. Outsourcing assignments to generative AI is intellectual dishonesty and robs students of the opportunity to learn these skills themselves. The extensive provision of AI tools will result in asking less of CSU students — de-emphasizing authentic learning and preparing them for less demanding, de-skilled roles in the workforce. We already know that AI has been used in applications that inflict social harm, especially when adopted without regulation. For example, as ProPublica recently reported, AI is implemented in the health insurance industry — where proprietary algorithms have been used to deny subscribers coverage for life-saving medical procedures. (Notably, this practice was recently banned in California.) There are also myriad privacy concerns surrounding artificial intelligence, as recent reports on the new Chinese AI product DeepSeek suggest. It is not clear how the data that students generate in CSU’s AI university will be used or how their privacy will be protected. The introduction of AI in higher education is essentially an unregulated experiment. Why should our students be the guinea pigs? Guest opinions in Open Forum and Insight are produced by writers with expertise, personal experience or original insights on a subject of interest to our readers. Their views do not necessarily reflect the opinion of The Chronicle editorial board, which is committed to providing a diversity of ideas to our readership. [Read more about our transparency and ethics policies](https://www.sfchronicle.com/standards/). The CSU administration has claimed that using AI will prepare students to join the AI workforce. This could be a positive outcome for some graduates. Yet university education is not just job training. A university education should provide students with the skills they need to confront a complex and rapidly changing world — one in which, given our murky information ecosystem, the truth can be hard to discern. Artificial intelligence products have already shown their capacity to [spread misinformation and disinformation](https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2811333), mislead the public and [undermine democratic processes](https://www.brennancenter.org/our-work/analysis-opinion/how-ai-puts-elections-risk-and-needed-safeguards). Recent research suggests that the use of generative AI is [associated with weaker critical thinking skills](https://www.mdpi.com/2075-4698/15/1/6). We see the AI university undertaking, at least in its present form, as antithetical to [CSU’s mission](https://www.calstate.edu/csu-system/about-the-csu/Pages/mission.aspx) — one pillar of which is “to prepare significant numbers of ​educated, responsible people to contribute to California’s schools, economy, culture, and future.” CSU **students need to develop the skills of critical thinking**, independent thought and respect for difference. Even amid austerity, **this requires a well-funded, well-staffed [school]** university that invests in people and capitalizes on its existing strengths. For better or for worse, **the work of creating educated, responsible people** at CSU **cannot be automated.**

#### **Salaries are key to retaining teachers AND maintaining quality.**

**Podolsky 16**, Anne Podolsky et al, researcher and policy analyst at the Learning Policy Institute, “Solving the Teacher Shortage”, 2016, https://learningpolicyinstitute.org/sites/default/files/product-files/Solving\_Teacher\_Shortage\_Attract\_Retain\_Educators\_REPORT.pdf

Teachers’ **salaries affect the supply of teachers**, including the distribution of teachers across districts, and the **quality** **and** quantity of individuals preparing to be teachers. Salaries also appear to **influence teacher attrition; teachers are more likely to quit when they work in districts with lower wages.** Of public school **teachers** who left the profession in 2012 and said they would consider returning, 67% **rated an increase in salary as extremely** or very **important** to their decision to return**. Teachers in high-demand fields such as math**ematics **and science are especially responsive to salary differences** in their decisions to remain in teaching because of the opportunity costs associated with the higher-paying jobs available to them. Despite the evidence that salaries influence teachers’ decisions to stay in the profession (and the quality of teachers attracted to the profession), teachers’ salaries are not competitive with those of other professions in many labor markets.

**Specifically,**

**Peck 24** [Devlin, Updated On December 9, 2024., 12-9-2024, "Why Teachers Quit + What You Can Do Instead", https://www.devlinpeck.com/content/why-teachers-quit

Research from the Economic Policy Institute shows that teachers are paid less (in weekly wages and total compensation) than their non-teaching colleagues.]

This feeling of being undervalued is leading high numbers of people to quit teaching. In fact, McKinsey research shows that **42% of educators have left because of poor compensation while 48% of educators are planning to leave.**

Forbes research also shows over 90% of public school teachers invest in their own teaching supplies. Even basic essentials such as paper and glue are not being covered by school funds. This means teachers are often earning even less than their low salaries.

#### **STEM is key to national security**

**Walden University confirms** (Walden University is an accredited institution offering online education bachelor’s, master’s, and doctoral degree programs, including a MS in Education with a specialization in STEM Education (Grades K–8). Expand your career options and earn your degree in a convenient, flexible format that fits your busy life.) “america-needs-more-teachers-for-stem-education“, Walden University, nd. <https://www.waldenu.edu/online-masters-programs/ms-in-education/resource/america-needs-more-teachers-for-stem-education>] ES

Science, technology, engineering, and mathematics—the four ingredients that make up **STEM**. It **is** these elements that many consider **key to America’s** innovation, global competitiveness, and **national security.** What will the future look like if there are no students interested in pursuing STEM careers? It’s a question that raises concern as **the U.S. falls behind internationally, ranking 30th in math and 19th in science** among industrialized nations.\*

The U.S. Department of Education reports that only 16% of American high school seniors are proficient in math and interested in a STEM career. Even among those who do go on to pursue a STEM major in college, only about half choose to work in a related career.† According to Teach For America, there will be 8 million STEM jobs available in the U.S. by 2018 but a vast majority of graduates will be unprepared to fill them.‡ What the country needs is more STEM teachers to not only educate America’s youth in these critical areas but also to energize and instill a sense of confidence and passion for pursuing STEM majors in college that lead to STEM careers.

**America Needs More Teachers for STEM Education**

Sounds simple, but it’s challenging. Judith Fraivillig, associate professor at Rider University, says kids tend to make up their minds about whether they like or dislike math and science by the fourth grade.‡ Those who decide they dislike STEM by age 10 are less likely to become a scientist, engineer, or innovator. The key is having enough STEM teachers to reach all students—regardless of socioeconomic status, zip code, or ethnicity—in order to inspire and prepare them to reach their full potential.

#### **US tech leadership prevents extinction.**

**Trotti 21** [(Christian Trotti is assistant director of the Forward Defense practice at the Atlantic Council’s Scowcroft Center for Strategy and Security. He is responsible for executing multiple facets of program administration, including strategy, business development, and event and logistical planning, and has authored and contributed to analyses on defense strategy, military technology, and nuclear deterrence.) “New Tech Will Erode Nuclear Deterrence. The US Must Adapt“, Defense One, 11-3-2021. <https://www.defenseone.com/ideas/2021/11/new-tech-will-erode-nuclear-deterrence-us-must-adapt/186634/>] ES

**Nuclear weapons are no longer enough to sustain U.S. strategic deterrence.** Senior military leaders and pioneering scholars believe a new technological revolution is now unfolding, and they are right. If we are not attentive now, the United States may lose the ability to deter major attacks in coming years.

The old model of strategic nuclear deterrence is increasingly threatened by a new suite of military technologies, from hypersonic missiles and advanced missile defenses to non-kinetic cyberattacks. Individually, these technologies are potent. But together, they will revolutionize the way that great powers deter and conduct war. **To avoid falling behind, the U**nited **S**tates **must** hedge against disruptive capabilities by **moderniz[e]**ing its existing nuclear arsenal and undertaking a systematic review of strategic capabilities for the 2030s. This vision for the future balance of strategic forces should then enable defense and diplomatic officials to determine investment priorities accordingly and decide when and how to engage Russia and China **to avoid strategic instability** in this new era.

These contemporary trends are best understood through the historical lens of revolutions in military affairs, or RMAs. While the history of warfare is mostly evolutionary, certain technological advancements—such as gunpowder, aviation, and precision-guided munitions—have revolutionized warfare and reshaped military balances and the geopolitical landscape.

Technology is not the only variable; RMAs require a convergence of technology, training, doctrine, and operational concepts, as well as a fundamental shift in underlying assumptions, to produce a new way of competing and fighting. For example, the United Kingdom invented tanks, but Germany revolutionized tank warfare by integrating armor, radio, and airpower with novel concepts for employing them. This produced the blitzkrieg of World War II.

The nuclear revolution was perhaps the most consequential RMA, since **nuclear weapons** could do what no other weapon had ever done: **pose an** instantaneous, **existential threat.** The preceding paradigm of strategic deterrence was instantly outdated, as large armies and navies no longer sufficed to deter major attacks. The advent and continual evolution of nuclear weapons ultimately precipitated a new approach to deterrence during the Cold War, wherein only a “triad” of nuclear delivery systems—strategic bombers, intercontinental ballistic missiles, and submarine-launched ballistic missiles—was deemed sufficiently diversified to survive any enemy first strike and retaliate, thereby maintaining stability between nuclear-armed adversaries. These capabilities, which so uniquely affect the very decision to wage war, are termed “strategic forces.”

A new, second RMA in strategic forces is now underway on the backs of an array of **emerging tech**nologies like hypersonic weapons, advanced missile defenses, artificial intelligence and autonomous systems, high-performance data analytics, quantum computing and sensing, space-based sensors and anti-satellite weapons, and cyberweapons. These threaten to **undermine[s]** the **long-standing nuclear deterrence** paradigm and alter the balance of power among the United States, Russia, and China. New capabilities can destroy, intercept, or blind traditional delivery systems, potentially enabling a devastating first strike and precluding adversary retaliation. The country that first develops a new model for using these capabilities in tandem with each other, mastering the emerging “strategic forces balance,” may become the next military and geopolitical hegemon.

This RMA poses distinct threats to each leg of the current nuclear triad. First, advanced Russian and Chinese air defenses are already challenging the stealth capabilities of U.S. strategic bombers. One of China’s leading defense companies claims to have developed a prototype radar that relies on quantum physics to detect the incredibly faint (and normally undiscernible) signals of stealth aircraft. Without stealth, U.S. nuclear-armed bombers could operate outside contested airspace and still reach their targets with standoff cruise missiles, but even those missiles may be increasingly less likely to prevail against more sophisticated missile defenses.

Second, in the wake of the United States’ successful kinetic missile defense test last November, ground- and sea-based missile defenses are vastly improving their ability to shoot down ICBMs and SLBMs, threatening the triad’s ground- and sea-based legs. While it is still relatively easy to overwhelm existing missile defenses, **new tech**nological **developments** in directed energy are very likely to **enable a more robust defense** against massed ballistic missile attacks. Meanwhile, shooting down a missile is not the only way to stop it; in many cases, it is preferable to destroy the missile before it ever launches. Here again, **emerging tech**nologies **soon will offer a solution**: travelling at over five times the speed of sound, hypersonic missiles supported by synthetic aperture radar satellites are increasingly capable of hitting heavily defended or time-critical targets, thereby enabling preemptive “left-of-launch” strikes against ballistic missile launchers.

#### **Even perceived US weakness causes global nuke war.**

**Means 21** Grady, Former Policy Assistant to Vice President Nelson Rockefeller, Retired American Business Executive, MA in Economics and Engineering from Stanford University, 8/30/2021, “Biden Brings The World Closer To Nuclear War,” <https://thehill.com/opinion/white-house/569732-biden-brings-the-world-closer-to-nuclear-war>

Over the past six months, the world has edged closer to nuclear war than it has been since the Cuban Missile Crisis. The Doomsday Clock is ticking toward midnight. The global power balance has been dramatically reshuffled, and the potential for disastrous miscalculation hasn't been so high in 80 years. The match and fuse for this is instability — an exaggerated **sense of U.S. weakness** and lack of capability and resolve — that could **lead[s] to** huge, **aggressive military miscalc**ulations and mistakes by our enemies. The Biden administration has set the table for such a catastrophe.

The timing could not be more dangerous. China has changed strategic direction and has been building its nuclear stockpile and delivery systems. China also has continued to develop hypersonic weapons, including stand-off “carrier killers,” space weapons and cyber capabilities to blind opponents’ strategic and conventional systems. Russia has been advertising (mostly for domestic consumption, but nonetheless worrying) its “unstoppable” delivery systems, and has a very capable nuclear stockpile and military. Iran will continue to move forward with building nuclear weapons. Pakistan and India both have significant nuclear capability in an increasingly unstable part of the world. Nuclear-armed North Korea is again assuming a more belligerent posture. Israel has a full nuclear triad (land, air, subs) to respond to existential aggression. The U.K. and France have significant nuclear deterrents. The world is a powder keg.

In Hollywood terms, today’s capacity for nuclear holocaust is thousands of times greater than the era portrayed in the Armageddon films “On the Beach,” “Fail Safe,” or “Dr. Strangelove.” There would not be anything left for “Mad Max.” Climate disasters may be unfolding over the next hundred years. Nuclear disaster is unfolding now. COVID-19 has killed more Americans than the flu typically does. **Nuclear war could kill us all**. Our leaders must get their priorities straight.

## **Our Second Contention is Critical Thinking.**

#### **Gen AI disrupts the processes that build critical thinking**

**Horvath 24** [Jared Cooney Horvath PhD, MEd is a neuroscientist and educator with expertise in human learning, memory, and brain stimulation. Jared serves as director of the Science of Learning Group and NeuroEducation: two teams dedicated to bringing the latest in brain research to education and business.] 7-16-2024, "The Limits of GenAI Educators", Harvard Business Review, https://hbr.org/2024/07/the-limits-of-genai-educators

University College London Professor Rose Luckin recently argued that, since ChatGPT can access and organize all the world’s knowledge, learners need no longer waste time learning “facts.” Instead, they can focus on higher-order thinking skills like creative and critical thinking. Unfortunately, much of what we term “creative” and “**critical” thinking** occurs via subconscious processes that **rel[ies] on internalized knowledge.** When we consciously think about a problem, humans can only actively consider a very finite amount of information due to the cognitive limits of working memory. However, once we stop consciously thinking about a problem, we enter into an incubation period whereby our brains subconsciously sort through our memory stores by seeking out relevant ideas. It’s during this sorting process (known as reconsolidation) that novel connections are made and better thinking emerges. “Even among highly skilled *human* educators, failure to cultivate an empathetic relationship inevitably hinders learning.” Here’s the problem: Subconscious reconsolidation only works with information that is stored within a person’s long-term memory, which means it cannot leverage information that is externally accessed or stored. This explains why experts almost always demonstrate stronger problem-solving skills than novices within their field of expertise, but rarely outside of it. This also explains why semantic dementia (whereby patients lose long-term memories but maintain cognitive faculties) impairs creativity nearly twice as much as frontotemporal dementia (whereby patients lose cognitive faculties but maintain long-term memory stores). Simply put, **using AI to help learners avoid the tedious process of memorizing facts is the best way to ensure higher-order thinking skills will never emerge.** But, you may be asking, what about learners who use AI to merely assist with fact memorization? Well, consider that textbooks have historically been written by experts—people with enough deep knowledge to aptly vet and organize information into a meaningfully structured curricula.Large language models (at least in their current form) have neither oversight nor vetting. This means **learners who use AI are very likely to encounter wrong**, oddly sequenced, or irrelevant **information which**—if memorized—might very well **derail[s] their path to mastery.** Of course, AI models will improve and information will surely increase in accuracy. Unfortunately, this won’t address the issue of vetting.

#### **Studies prove the devastating effects.**

**Knapp 25** (Alex Knapp is a Forbes senior editor covering healthcare and science since 2011., "The Prototype: Study Suggests AI Tools Decrease Critical Thinking Skills", Forbes, https://www.forbes.com/sites/alexknapp/2025/01/10/the-prototype-study-suggests-ai-tools-decrease-critical-thinking-skills/, 1-10-2025, DOA: 2-20-2025)

New AI tools are slowly becoming ubiquitous, being added to the software and hardware we use every day (sometimes whether we like it or not). But if we’re using artificial intelligence to perform tasks, search for information and solve problems, what does that mean for the intelligence we’re born with?¶ To figure this out, a team of researchers conducted **a study involving 666 individuals** ages 17 and up, **representing a diverse population.** It first evaluated the extent to which each of them made use of AI tools, then **tested their critical thinking skills.** The results of the study, which were published in the journal Societies, **[and] found that those who used AI tools** a lot **showed worse critical thinking abilities than those who didn’t** use them often or at all. **Whether someone used AI tools was a bigger predictor of a person’s thinking skills than any other factor,** including educational attainment.¶ **The reason for this is** a phenomenon called **“cognitive offloading”** – where people’s thinking and problem-solving are essentially delegated. Frequent cognitive offloading **reduc[ing] a person’s ability to** independently **think and solve problems.** “This relationship underscores the dual-edged nature of **AI** technology,” the study authors wrote. “While it enhances efficiency and convenience, it inadvertently **fosters dependence, which** can **compromise[s] critical thinking skills over time.” These findings are consistent with other studies** that have shown a similar negative impact from AI tools on critical thinking skills. The authors note, however, that other studies show AI tools can be beneficial when they complement critical thinking, rather than offloading it. “Future research should explore strategies to integrate AI tools in ways that enhance rather than hinder cognitive engagement,” they wrote. “Ensuring that the next generation is equipped with the skills necessary to navigate an increasingly complex digital landscape.”¶ Stay tuned.

**Critical thinking is key for democracy**

**Burbules 23** [Nicholas C. Burbules. Gutgsell Endowed Professor of Education Policy, Organization and Leadership and an affiliate of the Unit for Criticism and Interpretative Theory at the University of Illinois at Urbana-Champaign. September 19, 2023. “Critical Thinking and the Conditions of Democracy”. Education Policy Analysis Archives. https://epaa.asu.edu/index.php/epaa/article/view/8062. Accessed March 5, 2025]

One of the main reasons offered in support of **critical thinking** as an educational aim **is** that it is **a basic condition of** democratic citizenship. A clear statement of this rationale is offered by Sharon Bailin and Harvey Siegel (2002):

To the extent that we value **democracy**, we must be committed to the fostering of the abilities and dispositions of critical thinking. **Democracy can flourish** just **to the extent** that **its citizenry is able to reason well** regarding political issues and matters of public policy, **scrutinize** the media, **and** generally **meet the demands of democratic citizenship,** many of which require the abilities and dispositions constitutive to critical thinking. (p. 189)

One can add further to this rationale **in light of** recent **political development**s **in** countries around the world, including **the U**nited **S**tates: **the absence of critical thinking** skills among a large proportion of citizens **leaves democracies vulnerable to demagoguery and** outright **deception** (Samaržija, 2023). **Citizens must possess** relevant knowledge and the ability to critically evaluate knowledge claims; awareness of, and resistance to, the potential of social media to drive disinformation and distorted political ideologies; and a critical understanding of the power of rhetoric in a media-driven political environment—not only lies per se, but also that broader range of deceptive speech Harry Frankfurt (2005) calls “bullshit.”

The literature on teaching critical thinking typically distinguishes two conditions: one includes the abilities or skills of analyzing fallacies and other flaws in reasoning; the other is variously termed a commitment to **critical thinking** or a disposition **to exercise those skills** in actual situations. The first condition is relatively empty without the second, but much of the literature neglects the topic of how to foster the second, something that is harder to achieve, especially in a time animated by an anti-critical thinking ethos. The commitment to critical thinking, like other civic virtues, requires personal qualities of persistence and **sometimes** even courage, because sometimes it requires **swimming against the tide of popular opinion.** Therefore, it requires not only individual fortitude but also networks of social support and encouragement so that when one asks tough questions or challenges orthodoxies, one is not entirely alone.

**Democracy solves extinction.**

**Kemp 21** [Luke Kemp is a senior research associate at the Notre Dame Institute of Advanced Study, The Future of Humanity Institute, Oxford. Centre for the Study of Existential Risk, Cambridge. "Democratising Risk: In Search of a Methodology to Study Existential Risk" https://arxiv.org/ftp/arxiv/papers/2201/2201.11214.pdf] DOA: 02-09-2025 //Ewan

There is an intimate and neglected relationship between existental risk and democracy.

**Democracy** must be central to efforts to **prevent[s]** and mitigate **catastrophic risks.** It is also an antidote to many of the problems manifest in the TUA. Do those who study the future of humanity have good grounds to ignore the visions, desires, and values of the very people whose future they are trying to protect? Choosing which risks to take must be a democratic endeavour.

We understand democracy here in accordance with Landemore as the rule of the cognitively diverse many who are entitled to equal decision-making power and partake in a democratic procedure that includes both a deliberative element and one of preference aggregation (such as majority voting)sis. Decision-making procedures are not either democratic or non-democratic, but instead lie on a spectrum. They can be more or less democratic, inclusive, and diverse.

The democratic constraint of extreme measures may simply be a form of collective self-interest. **Voters are unlikely to tolerate** global catastrophic risks (**GCRs**), which incur the death of a sizeable portion of the electorate, if they know they themselves could be affected. We expect that scholars who do not support sacrificing current lives in the name of abstract calculations, but would still like to explore the use of expected value theory in existential risk, will be in support of democratic fail-safe mechanisms.

We posit three reasons for why we should democratise research and decision-making in existential risk: the nature of collective decision-making about human futures, the superiority of democratic reason, and democratic fail-safe mechanisms.

Avoiding human extinction, or crafting a desirable long-term future, is a communal project.

Scholars of existential risk who take an interest in the future of Homo sapiens are choosing to consider the species in its entirety. If certain views are excluded, the arguments for doing so must be compelling.

**Democracy will improve** our judgments in both the **governance and the study of existential risks.** Asking how our actions today influence the long-term future is one of the most difficult intellectual tasks to unravel, and if there is a right path, democratic procedures will have the best shot at finding it. Hong and Pagel6,117 demonstrate both theoretically and computationally that a diverse group of problem-solving agents will show greater accuracy than a less diverse group, even if the individual members of the diverse group were each less accurate. Accuracy gains from diversity trump gains from improving individual accuracy. Landemore115, builds on this work to advance a probabilistic argument that inclusive **democracies** will, in expectation, make epistemically superior choices to oligarchies or even the wise few. This is supported by promising results in inclusive, deliberative democratic experiments from around the worldils. In the long run, democracies should **commit fewer mistakes than alternative decision-making procedures.** If this is true, it should improve the accuracy of research efforts and decision-making. We are more likely to make accurate predictions about the mechanisms of extinction, probable futures, and risk prevention if the field invites cognitive diversity, builds flat institutional structures, and avoids conflicts of interest.

**Democracies** can **limit harms.** Any approach to mitigating existential threats could create response risks, and the TUA seems particularly vulnerable to this. Despite good intentions and curiosity-driven research, it could justify violence, dangerous technological developments, or drastically constrain freedom in favour of (perceived) security. If we hope to explore ideas but minimise harms, democracies can be used to moderate the measures taken in response to harmful ideas. It seems, for example, vanishingly unlikely that a diverse group of thinkers or even ordinary citizens would entertain the idea of sacrificing 1 billion living, breathing beings for an infinitesimal improvement in reaching an intergalactic techno-utopia. In contrast, the TUA could recommend this trade-off.

There are many ways to consider the interests of the many. Democratic assemblies could allow global citizens to deliberate about the futures they prefer, citizens could be surveyed, and the field of ERS itself could be diversified. At the moment, the field is, as many academic disciplines are, unrepresentative of humanity at large and variably homogenous in respect to income, class, ideology, age, ethnicity, gender, nationality, religion, and professional background. The latter issue is particularly true of existential risk, which, despite being an inherently interdisciplinary endeavour, is at the highest levels dominated by analytic moral philosophers. We need to be vigilant to what perspectives are not represented in the study of existential risk. An awareness of bias will go some way towards mitigating its negative effects. To get close to replicating the cognitive diversity found among humans, we must begin by inviting different thinkers with different values and beliefs into the field.

**Empirically, this** fail-safe mechanism seems to **work[s]**. Even deeply imperfect democracies, like the ones we inhabit now, often avert detrimental outcomes. **Democracies prevent famines** 9 (although not malnutrition) 20. **They make war** — a significant driver of GCRs — **less likely.**

**Thus, we are proud to negate.**