



Policy Implementation in the Era of Responsible Artificial Intelligence (AI) Use in K-12 Education

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ABSTRACT

The recent advances in artificial intelligence (AI) have captivated the attention of many while raising the alarm among activists and policymakers. Although AI has its benefits, it has simultaneously contributed to increased polarization, the proliferation of mis/disinformation, online safety and privacy concerns, exacerbated mental health challenges, and questions about the ethical use of these technologies. The disproportionate influence of AI biases on Black, Latine, and Native communities and the continued exclusion of these communities from computing requires the adoption of new K-12 educational policies to ensure equitable access to AI education and equip students to be responsible and competent creators of technologies.

CCS CONCEPTS

• social and professional topics • professional topics • Computing education

KEYWORDS

Artificial intelligence, policy, ethical AI, equitable AI, K12 education, K12 computer science, AI implementation

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1 INTRODUCTION

The technology sector continues to play an increasingly vital role in the U.S. economy, employing 9.4M workers, paying 103% higher than the median national wage, and contributing \$1.97T dollars to the country's economy [1].

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Furthermore, a technological revolution has been catalyzed across the globe with recent advancements in such areas as artificial intelligence (AI), autonomous systems, and machine learning. The proliferation of AI and autonomous systems, as well as the algorithms that drive them, are among the most impactful technological advancements in the past century. Algorithms and AI are utilized in search engines [2], social media feeds [3], digital voice assistants [4], and in more consequential areas including policing and surveillance [5], healthcare [6], employment [7], financial services [8], and even the democratic process [9]. Technology now influences economic, health, and safety outcomes. With technology no longer siloed in its own industry (i.e., 58% of technology professionals worked in other industries) [1], these advancements have an outsized impact across every industry and sector. Between 2021 and 2023, job postings on LinkedIn mentioning AI have more than doubled [10]. As such, technical professionals skilled in AI will be required for the future of the workforce.

However, Black, Latine, and Native individuals are being shut out of opportunities to develop new digital and technological skills to keep pace with AI advancements and demands for the workforce of the future. Continuing to exclude entire segments of the population is a strategic failure that threatens the country's economy and further exacerbates deeply divided communities along lines of racial, ethnic, and socioeconomic equity. This exclusion begins in K-12 CS education and replicates across the tech ecosystem. A lack of justice-centered computer science (CS) and AI education as well as the exclusion of talent and the homogeneous technology workforce to date has dire implications for the safety of Black, Latine, and Native communities. As such, the upskilling of students on the technical and ethical competencies of building and using AI technologies and providing educational access to all students (especially those from marginalized communities) is imperative for a thriving tech ecosystem.

K-12 education policy must be reimaged to ensure students learn and utilize this rapidly evolving area of AI that has an outsized impact on the civil liberties and civil rights of marginalized communities. In addition, K-12 education policy will need to incorporate systematic and comprehensive approaches to ensure that all students can access and are equipped and skilled in this new AI-enabled future with an ethical and equitable lens.

2 POLICY NEEDS TOWARDS RESPONSIBLE AI USE

Algorithms and AI tools (underlying technology across sectors and industries) have contributed to increased polarization [11], the proliferation of mis/disinformation [12, 13], increased online safety and privacy concerns [14], and exacerbated mental health challenges [15]. Furthermore, researchers have documented biases and systemic inaccuracies in AI software that disproportionately impact Black, Latine, and Native individuals detrimentally. Algorithms are biased in their design, from utilizing biased or inadequate datasets [16] to the lack of diversity in technical teams [17]. Biased algorithms in healthcare restrict the care provided to Black patients [18]; the criminal justice system has been shown to classify Black defendants as “higher risk” for recidivism and subjected to harsher sentences [19]; in the hiring process reproduce existing discrimination based on marginalized identities [20]; in the homeownership process have led to the denial of loan applications for Black, Latine, and Native applicants [21]; and in the false arrests of Black people due to inaccurate facial recognition [22]. The widespread deployment and utilization of AI tools, with demonstrated impacts on civil liberties and civil rights, highlight the need for more systematic and comprehensive approaches to drive a more ethical and equitable lens in the development of future AI systems.

In the K-12 education space, AI is expected to transform the future of teaching and learning and improve educational outcomes through differentiation and accessibility, while also exacerbating challenges including plagiarism, bias, disinformation, and data privacy concerns [23]. Instead of tackling these benefits and risks directly, school leaders have raised questions about the ethical use of these technologies in schools and in some cases, banned the use of these tools. Rather than avoid the inevitable shift towards AI tools, K-12 educational policies must be revised to meet this rapidly evolving landscape to ensure students are equipped to critically use and inform the development of such systems.

New frameworks, guides, toolkits, and policy recommendations have been developed to help educators, legislators, and education technology creators understand the benefits and risks that are presented by the evolution of AI and adopt policies and practices to enable responsible, ethical, and inclusive development and utilization of AI tools in education. Yet, a key element is glaringly missing from these conversations about the future of AI in education. While it is critical to delineate guidance for how teachers, students, and schools use AI tools in the advancement of education, it is equally important to prioritize how students and educators interrogate ethics, equity, and justice in the creation, deployment, and utilization of AI technologies as a core component of a robust K-12 education.

The examination of ethical and equitable concerns about AI technologies has historically been a small component of computing education, incorporated into teaching and learning standards and the learning goals of Advanced Placement CS

courses. More recently, these topics have been incorporated into national guidelines for K-12 AI education. However, the critical examination of the technologies that are ubiquitous in students’ and educators’ lives, impact social and democratic structures and have disproportionate impacts on marginalized communities must not be a peripheral part of computing education. As such, optimal learning experiences must ensure students develop the core competencies to interrogate the ethical and equitable development, deployment, and impacts of AI, while simultaneously challenging, disrupting, and remedying the harms that these technologies can produce within individuals’ lives, communities, and society at large. Policies and practices adopted across schools must intentionally center racial and social justice in the examination of AI systems.

For instance, school- and district-level policies must be established [24] with a broad swatch of education partners, including educators, administrators, students, and families to clearly delineate and agree to what AI will be used, how AI will be utilized, to what end it will be utilized, the level of data privacy students can expect, potential risks of AI usage, and the approach to school communication of AI deployment and outcomes of usage. AI has significantly impacted historically-excluded communities by perpetuating algorithmic bias; therefore, school communities (particularly those serving marginalized communities) must be transparent with its use of AI and articulate a strategic plan to mitigating risks and maximizing the impact of bringing it into classrooms.

While AI and AI-enabled tools become more prevalent in education, more than one-third of teachers reported not utilizing it yet [25], thereby leaving questions of who is gaining access and who is being left behind. Furthermore, biases brought along by the integration of AI have already been flagged where non-native English speakers have been falsely accused of cheating on written work [26]. To ensure educators are equipped with the skills to use AI while minimizing harm and maximizing learning will require AI literacy. Schools of education must shift departmental policies to ensure AI literacy skills are built across their teacher cohorts. AI no longer lives in siloed CS classrooms; therefore, all educators must be supported to identify the goals of utilizing AI, the potential biases and equity issues built into the usage, and approaches to auditing usage to ensure it continues to benefit all students.

Districts must also prioritize policies that ensure students (as future technology innovators) have the space and time to interrogate the ethics, equity, and justice in the creation, deployment, and utilization of AI technologies. For example, Kapor Foundation’s Responsible AI and Tech Justice Guide (2024) outlines six components that are recommended as an approach to inform responsible AI classroom practices as follows: 1) examine the AI technology creation ecosystem from design to production, to investors, to the end users who benefit from their adoption; 2) interrogate the complex relationship between technology and human beings, including human-computer interaction, issues of

values, ethics, privacy, and safety; 3) explore the impacts and implications of AI technologies on society; 4) interrogate personal usage of AI technologies to become critical consumers of products and address misuse, exploitation, and safety concerns; 5) build a critical lens in the collection, usage, analysis, interpretation, and reporting of data; and 6) minimize, mitigate, and eliminate harm and injustice caused by AI technologies through the responsible and ethical creation process and individuals' and collective right to refusal.

3 POLICY NEEDS TOWARDS DIVERSIFYING ACCESS TO RESPONSIBLE AI

Given the linkage between CS education and AI, the structural issues that excluded marginalized students from CS courses will continue to limit who has access to and participates in AI use in schools. Not only are Black, Latine, and Native students less likely to have access to CS education [27], but when it is available, strategies to broaden participation focus on racialized myths about student-based deficits, like aptitude or appeal. Without pivoting towards strategies to address the systemic failures that impact meaningful participation among these students, broadening participation efforts will continue to fail. Data have shown for decades that more white and Asian students than Black, Latine, and Native students are provided access to CS courses [27]. Furthermore, AP CS data continue to show significant equity gaps despite recent efforts to diversify. Far fewer Black, Latine, and Native students pass AP CS exams, with an even greater gap existing for Black, Latine, and Native girls [28].

Moving forward, the proliferation of AI use in education will likely exacerbate the challenges found in the broader CS education field without addressing the structural failures such as the absence of early, repeated, and high-quality exposure to computing and AI; culturally relevant curricula embedding AI content; culturally-competent educators; a diverse and supported teacher workforce; resources and material to implement effective AI use in classrooms; and adequate engagement and recruitment strategies within those courses using AI.

For example, AI integration requires all schools to ensure the most basic structures are in place for this technology use for their families served. However, approximately 28M Americans lack access to reliable high-speed broadband at home, and marginalized communities are much more likely to be disconnected from the broadband critically needed to learn [29]. One in three Black, Latine, and Native families lack high-speed home internet and one in three families who earn less than \$50K annually lack high-speed home internet. Beyond the lack of access to broadband networks, Black, Latine, Tribal, and rural communities are less likely to have broadband that is reliable, affordable, and has adequate speed. This will require policies that allocate funding to support high speed connectivity and infrastructure investments that expand service options and create new competition that can result in universal

coverage, lower prices, faster speeds, and increased reliability across all zip codes.

Furthermore, the CS educator workforce has already been shown to be majority white, while the student population continues to grow in racial and ethnic diversity [30]. A culturally-competent educator workforce requires policies that incentivize future educators from varied demographic backgrounds to envision themselves in a sustainable future in education. As it stands, Black college graduates owe more than white college graduates; Latine college graduates borrow as much as white college students, yet default at twice the rate [31]. The debt gap between white students and their Black and Latine counterparts lead to students with greater debt targeting higher earning jobs. Therefore, incentivizing lower wage roles such as those in education to get Black and Latine graduates to enter the path, such as loan forgiveness policies will be essential to diversifying the educator workforce.

Beyond federal and state policies, schools of education departmental policies must prioritize the integration of culturally-responsive curricula and pedagogy into pre-service teacher education, professional development, and certification programs that equip educators to implement *high quality* CS and AI education. While national efforts to expand equity in CS education have primarily focused on the creation of new courses (Exploring Computer Science, AP CS Principles), providing professional development to expand the pool of CS teachers, mandating CS courses for all students, and developing frameworks and standards [32], preservice education is an essential component of broadening participation efforts. Yet, adapting preservice education has been slower to come, with states beginning to integrate CS and computational thinking (CT) content in preservice teacher programming [33]. Yet, without a specific focus on racial equity, these efforts may exacerbate disparities if teachers are ill-prepared to deliver culturally-responsive and culturally-relevant instruction. Culturally relevant/responsive pedagogy (CRP) has been marginalized in teacher education, treated superficially in teacher preparation programs [34], and not rigorously applied to CS educator preparation.

4 POSITIONALITY

The first author is the Director of CS Equity Initiatives of a national philanthropic organization aiming to advance racial equity in tech and entrepreneurship. Her background is in K-12 education, spending 16 years working in both public and private K-12 schools in computer science, health, and physical education. While at her current organization, she developed and launched the Responsible AI and Tech Justice Guide for K-12 Education, helped develop the Culturally Responsible and Sustaining Computer Science Framework and accompanying instructional resources for the framework, helped co-led and developed the Justice-Centered Computer Science Initiative, and has led professional development around equity in computer science for teachers nationwide.

The second author is the CEO of a national philanthropic organization aiming to advance racial equity in tech and entrepreneurship. At the organization, she leads efforts to: (a) conduct research on barriers and solutions to racial inequality in tech, (b) operate programs and invest in pathways into the tech/entrepreneurship workforce, and (c) work in partnership with partners to advocate for transformational change in policies and practices to expand racial equity in technology. She is currently a Principal Investigator on multiple national grants and has co-authored reports to expand equity in computer science education and increase participation of Black, Latine, and Native women in the computing ecosystem. While at her current organization, she led the development of the Responsible AI and Tech Justice Guide for K12 Education, the Culturally Responsible and Sustaining Computer Science Framework, co-led and developed the Justice-Centered Computer Science Initiative, and co-authored several landscape reports on CS teachers and the state of tech diversity for Black, Latine, and Native communities.

The third author is a professor of education policy at a public flagship university. His research focuses on advancing educational improvement and systems change through strategic partnerships. This includes studying computer science education policy, interscholastic athletics, and how to support students' school attendance. He has authored multiple research articles, conference proceedings, and reports that have focused on how to support and scale educational opportunities for students.

The fourth author is the CEO of a national nonprofit organization that aims to catalyze education transformation by bridging gaps in data, policy, practice, and research to center the needs of the field in accelerating innovation toward an equitable, inclusive, and radically different future for all learners. She has a background in K12 education as the founder of a charter school in downtown Brooklyn and has spent more than a decade in K12 education, where she now leads multi-stakeholder alliances and national initiatives. In her current leadership role, she leads the EDSAIE AI Alliance focused on promoting the safe, equitable, and responsible use of AI in education through global, federal, and state-level policy work informed by a national network of district policy labs.

The fifth author is a practitioner and national edtech leader who has served at the local, state, and federal levels. Her identity as a queer woman profoundly influences her approach to educational policy where she advocates for culturally relevant education for multilingual learners, students with disabilities, and LGBTQI+ students across rural, suburban, and urban systems. In her policymaking role, she emphasizes a human-centered approach, ensuring that those affected by educational policies are integral in co-development. Her work consistently reflects her commitment to inclusivity, striving to create an equitable education system for all learners.

The sixth author is the Chief Research Officer at a national philanthropic organization aiming to advance racial equity in tech

and entrepreneurship. Her background in positive youth development underlies her current research endeavors to understand the socioecological underpinnings of inequity. While at her current organization, she developed and implemented longitudinal evaluation plans for STEM/CS intervention programs to assess the social-emotional and academic outcomes of Black, Latine, and Native students and to identify key experiential and programmatic elements to enhance youth outcomes. She has led the development and writing of several landscape reports on CS teachers and the state of tech diversity for Black, Latine, and Native communities.

5 IMPLICATIONS FOR THE RESPECT COMMUNITY

The burgeoning area of AI will require research collaboration among educators, students, advocates, researchers, and policymakers in the development of effective policies to ensure access to and responsible and equitable AI use in K-12 education. Inter-disciplinary research that identifies promising policies in the successful adoption of AI tools and justice-centered changes in K-12 education to ensure *all* students and teachers are equipped with the knowledge, skills, and resources to become critical consumers and ethical producers of the next generation of technologies is necessary. The RESPECT community will play a key role in building this network of aligned K-12 partners toward this new vision of responsible AI use in K-12 education.

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