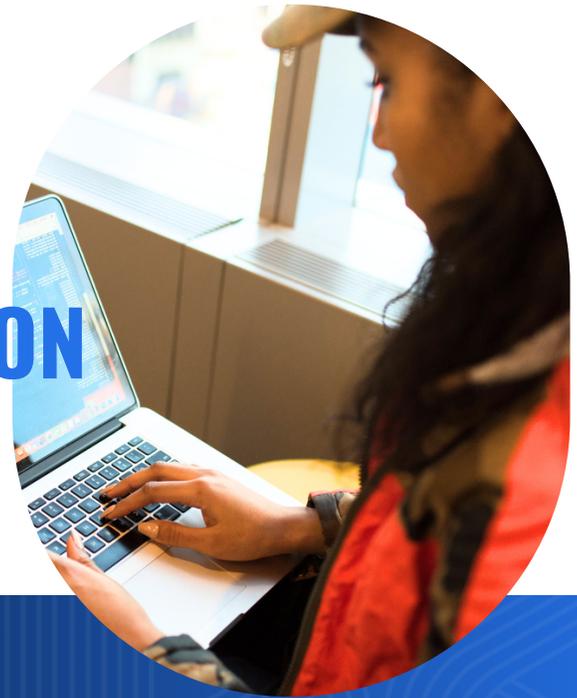




JUSTICE-CENTERED COMPUTING EDUCATION

A Framework for Action



THE CONTEXT

Despite decades of investment and initiatives led by federal, state, and local governments, tech companies, educators, community organizations, and nonprofits, computing education remains a picture of dramatic injustice. The opportunity to gain early exposure and develop skills and knowledge remains only accessible to select groups of students. Black, Latine, and Native students, girls/non-binary students from low-income backgrounds, students with disabilities, and students living in rural areas are significantly less likely to have computer science (CS) courses available in their schools. The CS teacher workforce is predominantly White, teachers vary widely in their ability to incorporate culturally responsive pedagogy in CS classrooms, and the availability of curricular resources to effectively engage students from all backgrounds remains limited.

The pervasive inequities in computing education are mirrored in the highly-profitable and rapidly growing tech sector, with women, Black, Latine, and Native professionals dramatically underrepresented across all levels, Black representation across the top tech companies increasing only 1 percentage point since 2014, and less than 2% of venture capital deployed to Black, Latine, and Native entrepreneurs--which have lasting implications for the design, deployment, and impacts of technology. The rapid proliferation of artificial intelligence and efforts to incorporate AI into education systems, without preparing students and teachers to interrogate its ethical and equitable development, threaten to further exacerbate algorithmic bias and the discriminatory impacts of technologies. And the broader climate of attacks on efforts to improve equity--ranging from the SCOTUS decision overturning affirmative action to legislation banning the teaching of topics related to the history of racism, diversity and equity, and LGBTQ+ inclusion--have significant implications for efforts to expand equity in computing education.

The unaddressed realities of systemic racism, sexism, and ableism, vast economic disparities, and deeply entrenched educational inequity in school funding and resources underlie the pervasive injustice we continue to see in computing. We argue that the majority of efforts to expand computer science education, to-date have:

- **Narrowly focused on expanding participation in computing disciplines without acknowledging and addressing fundamental structural inequalities in education and society more broadly**
- **Utilized broad or unclear definitions of equity that fail to articulate the ways that equity gaps in computing education can be addressed or center the experiences of marginalized populations**
- **Made minimal attempts to articulate the ways in which the backlash to racial justice movements and frameworks for understanding the history of racism and attacks on the civil rights of people of color, women, disabled people, and LGBTQ+ individuals undermine our work for equity in computer science education and align ourselves in direct opposition to these threats**
- **Attempted to remain neutral and singularly focused on the discipline of computer science without acknowledging that the fight for equity and justice in computing education is inherently a political, though non-partisan, act**
- **Embraced the promise and potential of new and powerful AI technologies in education without prioritizing the interrogation of ethics, equity, and justice in the creation, deployment, and utilization of AI technologies as a component of a robust K-12 education**

Thus, we argue, the computing education interventions and advocacy efforts we have taken on in the past decades are constrained by these realities, and they remain permanent limitations to success in creating a robust, diverse, justice-centered, and inclusive computing sector and society more broadly.

A NEW VISION

This points to the need for a radically different framework guiding the current national CS education agenda. What's needed is nothing short of a full-scale revisiting of the ways in which we have approached everything from the design of our curricula and the ways we prepare teachers, to the development and advocacy of policies to achieve equity in education, full participation in computing, and systemic change in society more broadly. We also seek to imagine new possibilities and ambitious aspirations for what can be achieved when justice is centered in CS education to inspire and propel students, educators, families, and communities forward in truly achieving computer science for all.





We envision a computer science education ecosystem where all students experience inclusive and equitable learning environments that enable the interrogation of the creation of technology, the examination of ethical concerns, risks, and harms, and the building of knowledge to harness the power of computing for justice.

In pursuit of this vision, we are committed to the full participation of every student in a quality K-12 computing education, which first requires a focus on dismantling systemic inequality in education broadly. We must then focus our efforts on centering and prioritizing programs, initiatives, and policies that address the experiences of students from historically marginalized and excluded groups, in order to address systemic disparities in computing. And finally, we must adopt a justice-centered, culturally responsive, and community-driven approach to the design of computer science education standards, curricula and pedagogy that explicitly and critically cover topics of ethics, equity, and impacts of computing, to ensure meaningful and equitable engagement in CS throughout K-12 education and beyond.

A FRAMEWORK FOR JUSTICE-CENTERED COMPUTING EDUCATION

The framework for Justice-Centered Computing Education is intentional about building upon existing frameworks, research, and scholarship, including Culturally Responsive-Sustaining CS, the broadening participation in computing movement, Ethical AI, and targeted universalism and articulates the following definition:

Justice-centered, equitable K-12 computer science education addresses structural educational inequality, critically interrogates the computing ecosystem, and develops with intentionality the resources, programs, and policies to achieve full access and meaningful outcomes for students of all identities and abilities. This requires an explicit focus on students underrepresented in computing as well as those that sit at the identity intersections of race, ethnicity, gender, disability, and socioeconomic status.

The framework for Justice-Centered Computing Education outlines nine core pillars that are critical to defining, designing, and implementing the strategies that will work in tandem to achieve this new vision for computing education:

VISION

An articulated vision for what will happen when equity and justice in CS education are a reality

SHARED DEFINITION

A clearly articulated definition of equity and justice in computing education

POLICY AGENDA

A policy framework that aligns with the vision for equity and justice in computing and a set of specific policies that focus on achieving equity

RESEARCH & DATA

A shared approach to collecting and reporting on data that incorporates equity, assesses progress towards our goals, and a robust research agenda to study impacts of interventions

STANDARDS	A set of K-12 CS standards that fully incorporate equity, justice, ethics, and culturally responsive-sustaining content
CURRICULUM	A framework for curriculum development centering equity and justice, and the development of robust computer science curricula and teaching resources for implementation in K-12 classrooms
PEDAGOGY & TRAINING	A framework/model to guide pre-service and in-service training pathways, professional development, and coaching that centers culturally responsive-sustaining computing pedagogy and justice.
FUNDING	A funding strategy for deploying philanthropic and government resources to advance justice and equity in computing
COALITION-BUILDING	A multi-stakeholder coalition to advance this new vision including: Government, Industry, Philanthropy, CS education organizations, Education advocacy groups, Civil rights organizations, among others.

BUILDING A MOVEMENT

As computer science education leaders, we make the argument for a fundamentally different approach to shape the future of CS education and ultimately, achieve more equitable outcomes. We believe that in order to achieve this new vision, intentional and strategic collaboration will be critical and we will be meeting with colleagues and organizations across the country to develop and launch initiatives that we hope will build the momentum for lasting change. We invite feedback and collaboration from aligned partners.



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