Abolitionist Computer Science Teaching: Moving from Access to Justice

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Abstract—As high school computer science course offerings have expanded over the past decade, gaps in race and gender have remained. This study embraces the "All" in the "CS for All" movement by shifting beyond access and toward abolitionist computer science teaching. Using data from professional development observations and interviews, we lift the voices of BIPOC CS teachers and bring together tenets put forth by Love (2019) for abolitionist teaching along with how these tenets map onto the work occurring in CS classrooms. Our findings indicate the importance of BIPOC teacher representation in CS classrooms and ways abolitionist teaching tenets can inform educator's efforts at moving beyond broadening participation and toward radical inclusion, educational freedom, and self-determination, for ALL. (*Abstract*)

Keywords— computer science teaching, social justice, abolitionist teaching, critical computer science pedagogies

I. PURPOSE

In the past decade, computer science education (CS) has become infused in schools across the United States, and yet, there are severe and persistent gaps in access, participation, and achievement in computer science learning experiences. In fact, CS has one of the most pronounced racial participation gaps of any subject in high school, in terms of enrollment and achievement [1], a gap that continues to become more pronounced in college [2] and in industry professions [3]. This racial gap, however, extends beyond the students who are granted access to CS courses to also include the teachers in these classrooms. A recent study found that Black teachers comprised 3% of high school CS teachers, Latinx teachers comprised 8% of these teachers, and American Indian and Alaska Native teachers comprised 2% of these teachers [4].

In this context, and with CS continuing to become a core subject within high school curricula all across the United States, there is much to do with respect to equitable educational practices and pedagogy; not only regarding the notion of access to CS courses but also a consideration of what takes place in the classroom beyond the initial level of access. While this concern has been continually raised by scholars, [5, 6] much of the conversation, centered around the "CS for All" movement [7, 8] has been focused on notions of equity in terms of access to, and participation in, existing classes [9, 10], without taking into account the pedagogical commitments being centered.

Given the current sociopolitical context, reconceptualizing the field of CS to intentionally consider equity through understanding and dismantling racism is vital if we are to remedy the historical and persisting gaps in representation and the apolitical notions of the field [14]; if we are to move away from access and toward justice. Therefore, within the scope of this paper, we aim to understand how we might turn our attention past the naive and ineffective promises of CS access in order to think about how to reconceptualize CS as a field that truly embraces the "All" in the "CS for All" movement. We do this to consider the following research areas of inquiry: **1) the values that CS teachers bring with them into their classrooms; 2) the limits of a field that lacks both representation of BIPOC teachers and a consistent commitment to anti-racism; and 3) the possibilities that are found in centering the work and commitments of BIPOC CS teachers.**

II. THEORETICAL FRAMEWORK

Within the field of CS education, the move toward access for all students, while beneficial in opening pathways for some who have been traditionally excluded from CS learning, does not necessarily provide, nor ensure, genuine equity. In order to truly do the work of equity, we need to center anti-racism within the curriculum; a centering that has historically been absent within CS public school classrooms with few curricular exceptions. Further, researchers have asserted the necessity for CS pedagogies to center critical literacies, examine power relations, and make salient the sociocultural and political context in which CS is situated, in an effort to be truly inclusive of minoritized

groups [5, 6, 11, 12, 13]. Even with these conclusions in mind, the literature, research, and curriculum within the field of CS predominately centers a Eurocentric perspective with little attention paid to the teachers (or students) who exist outside of the mythical computing identity norm [15] of white, middle class, and male.

While many would argue that these trends are the very foundation of schooling in general, it is especially prevalent within the field of CS as white men tend to dominate this space both within education and industry [2, 16]. This positions many teachers in classrooms within an educational system committed to maintaining that education is, and should be, apolitical and neutral. Teachers are often asked to be "colorblind" and treat all students the same, rather than engage in conversations that disentangle differences and barriers to success. Teachers are often expected to maintain their classrooms as neutral places while avoiding conflict which could potentially promote growth or new ways of thinking.

When framing the goal of "CS for All" as merely access, many students of color find themselves in CS classroom spaces where teachers predominately engage in colorblind rhetoric, a form of systemic violence which minimizes and erases their histories and lived experiences [17, 18]. Colorblind rhetoric is a missed opportunity for learning and growth for all students in the classroom, and thus serves as a barrier to moving toward equity, which we argue is the first step toward anti-racist and ultimately abolitionist teaching. While efforts to support culturally diverse groups of students through curricula and pedagogies are taken up within culturally responsive frameworks, these theoretical approaches do not always explicitly center anti-racism as a core tenet. Therefore, we find that the framework of abolitionist teaching, which urges us to grapple with racism at the very root of schooling systems, helps to make central the difficult work of dismantling the underlying systems that cause persistent exclusion from CS.

Abolitionist educator Love describes abolitionist teaching as "tr[ying] to restore humanity for kids in schools [arguing that] abolitionist teachers are willing to put their reputation, home, and lives on the line for other people's children." Love goes on to frame this way of teaching and being as the choice to "engage in the struggle for educational justice" [19, p. 11] through a variety of means including a refusal to uphold policies and practices that dehumanize dark children while being committed to calling out teachers who engage in such behavior. By acknowledging the history of unjust and dehumanizing treatment of dark children within schools, abolitionist teaching creates space for Black joy, love, and solidarity in the fight to ensure that all students can thrive.

As co-conspirators in this work, we find it important to center the voices of those teachers in the field who engage in abolitionist teaching day in and day out; teachers whose lived experiences inform their pedagogy, their commitments, and their desire to enact change. We draw on the conceptual framework of Feminist Standpoint theory [20, 21, 22] to counter the common and dominant narratives forwarded within the literature [23]. We highlight the perspectives and teaching experiences of BIPOC (Black Indigenous and People of Color) CS teachers who express dedication in moving beyond access and colorblind rhetoric, allowing computing education research to benefit from a richer understanding of the enactment of anti-racist teaching.

III. METHODS

The gathering of, and learning from, teachers took place over a two-year period and was centered around two subsequent summer residential sessions of the ECS (Exploring Computer Science) professional development. This space brought together a diverse group of teachers from different regions of the United States. The data for this study was gathered over this two-year period and included participant observations and interviews with BIPOC-identifying teachers during their second summer of participation after their first year teaching the course. Participant observation notes were taken by the co-authors as we observed the professional development sessions. Field notes were then coded according to themes discussed by Love [24] as tenets of abolitionist teaching which included: mattering is essential, moving past gimmicks, refusing to take part in zero tolerance policies, calling out deficit perspectives, and acknowledging historical and systemic injustice. Interview data was similarly coded with a collaborative and iterative coding process to ensure interrater reliability. It is important to note that these conversations took place on the periphery of the main professional development, during breakfasts, lunches, and after workshop sessions.

As we engaged with the methods of research, we wrestled (and continue to wrestle) with how we might approach this work given our positionality as non-Black researchers grappling with what it means to do abolitionist research. Our positionality and the importance of centering BIPOC voices in a respectful and authentic manner is central to our research inquiry both within our theoretical framework and our research methods.

IV. DATA SOURCES

A total of 153 CS teachers participated in the PD in summer of 2018 and/or 2019, each of whom worked at a school that had committed to teach Exploring Computer Science the year following the summer professional development. As the purpose of this paper is to think intentionally about what it might look like to move beyond neutral notions of CS - away from access and toward justice, and to position abolitionist CS teaching as the bridge, the selected compiled fieldnotes center the experiences of BIPOC teachers in attendance during the first summer and field notes and 10 interviews that center BIPOC teachers in attendance during the second summer. Table 1 provides details offered by participants, describing their background and teaching school site.

TABLE I. INTERVIEW PARTICIPANTS

Participant	Teaching Location	Race/ Ethnicity	Gender	School Site
Jennifer	South Carolina	Black /African American	Female	Alternative school, majority black students
Rachel	New York	Latina /Latinx	Female	Majority Latinx students

Participant	Teaching Location	Race/ Ethnicity	Gender	School Site
Nadia	Texas	Indian	Female	Majority Latinx students
Carmen	Connecticut	Black/ African American	Female	Career Technical school, 30% Latinx students
Malia	Texas	Half Tongan, half Japanese	Female	Majority Latinx students, all ELLs
Jodi	Oklahoma	Taiwanese	Female	~50% Native students
Ciara	Texas	Black/ African American	Male	Talented and Gifted school, diverse students
Shawn	Maryland	Black/ African American	Male	Majority Latinx students
Micah	South Carolina	Black/ African American	Male	Alternative school, students who have been pushed out of district schools
Teagan	Delaware	Black/ African American	Male	Majority Black students

V. RESULTS

Throughout this study, we learned that while there exists an urgent need to move the framing of equity beyond access to a deeper consideration of CS content, there are many BIPOC teachers who are already doing this work in their classrooms across the United States; teachers who are actively engaging in what Love [24] refers to as abolitionist teaching.

Love uses the framework of abolitionist teaching as a way to center the humanity of dark students within schools and to move beyond equity and toward justice so that all students, and especially those students who have experienced "schools as a site of suffering" [25] are able to thrive rather than simply survive. Love describes a number of ways in which abolitionist teachers can engage in this work; the results of our study show that BIPOC CS teachers are *already* embedding many of these described tenets within their teaching such as: an understanding that mattering is essential for students within the classroom; an acknowledgement that there is a need to move beyond gimmicks and toolboxes that claim to solve all of education's "achievement gaps;" a general refusal to take part in zero-tolerance policies and instead an engagement in deep relationship and community building through a restorative justice mindset; both a desire and capacity to call out deficit perspectives within school buildings by teachers and administrators; and an acknowledgement of historical and systemic injustice discussed intentionally through the curriculum and embedded alongside CS concepts.

TABLE II.   MAPPING TEACHERS' PEDAGOGICAL STANCES ONTO LOVE'S (2019) ABOLITIONIST TEACHING

Abolitionist Teaching Tenets	Sample of Participant Observation and Interview Data
Mattering is essential	Carmen notes that she talks with her students about their lives outside of school. She says, "I give them the talk…You get stopped by police, keep your hands where they can be seen, do not make any sudden moves. Your life is not that important to them... I want you alive and I want you to go on and be successful. I tell these students… listen, this field [CS] is where you can make a difference.
Moving past gimmicks	Rachel continually centered her own identity, positionality, and trauma within her classroom as a move beyond "best practices" She noted that "[I'm] really honest with them. I'll be honest with them about growing up in a neighborhood where there were gunshots, where my friends did get shot... But it's really triggering sometimes, I have to do the work myself."
Refusing to take part in zero-tolerance policies	In her interview, Jennifer spoke candidly about how the administration and school resource officers at her school site wanted her to press changed careers from the corporate world to teaching to interrupt the School to Prison charges against students for their behavior. Refusing to press charges, as she originally
Calling out deficit perspectives	Teagan, who wants to be a positive role model for his Black students, said that if change is to occur we cannot only address or talk about race within certain parts of the CS curriculum; rather this needs to be embedded within the entire curriculum in explicit and intentional ways.
Acknowledging historical and systemic injustice	Shawn, who is very outspoken about centering discussions of race in his classroom noted that, "Every day I say it in my classroom. I say there is a systemic bias against you as a child of color and you have to understand this. I teach and I bring this to my class..."

Table II highlights the ways in which BIPOC CS teachers are centering the tenets of abolitionist teaching as they develop their curriculum, engage in planning and instruction, and work to develop relationships with their students. While this only presents a snapshot of the practices that these teachers are using in their CS classrooms, it demonstrates a pivot from considering access to CS classrooms as the target, to explicitly and intentionally centering a CS abolitionist teaching pedagogy and a move toward radically imagining justice within CS.

VI. SCHOLARLY SIGNIFICANCE

The current movement of CS education "for all" has focused almost exclusively on the inclusion of underrepresented groups of students, without a consideration of how teachers' identities, lived experiences, and ideologies shape equitable learning opportunities in computing classrooms and classroom pedagogy. The results of this study highlight the urgency of attending not only to inclusion at a level of access, but inclusion at a level of pedagogical stances that attend to the humanity and well-being of all children. While Goode, Ivey, Johnson, et al. [17] highlight the importance of acknowledging and moving beyond colorblind rhetoric within CS classrooms, this is only a first step. We argue that an embedded commitment to anti-racist pedagogy is necessary; pedagogy that is practiced by many BIPOC teachers throughout CS classrooms across this nation.

Though this study illuminated how abolitionist teaching tenets were demonstrated through the experiences of BIPOC teachers, these pedagogical enactments should guide the teaching aspirations of white teachers, too. Educators engaged in computing education, and especially those engaged in addressing equity in classroom teaching and professional development settings (which we argue should be foundational for all educators), can learn from the gifts of pedagogical knowledge and abolitionist teaching instances described by this group of teachers.

The results from this study also reveal how BIPOC CS teachers, in particular, approach their role in the classroom with a sense of collective responsibility and social justice commitment, embodying many of the core commitments expressed by Love [24]. Given the importance of these teachers' gender and racial representations as well as their lived experiences in driving their commitments to inclusion, the findings underscore the importance of recruiting, retaining, and supporting BIPOC teachers to be computing teachers in school classrooms. This includes supporting the development of BIPOC teachers' agency to enact change within the field in ways that honor their work, while not putting the labor solely on their shoulders.

Finally, we suggest that expanding on the 'for all' rhetoric with an abolitionist teaching approach will require *more* of the teacher. Teachers' CS content knowledge and pedagogical content knowledge alone is insufficient in confronting and dismantling race-related participation gaps in CS. Expanding our notions of the 'all' in "CS for All" must necessarily move beyond considerations of 'all bodies' having access to CS, and also embrace anti-racist pedagogy that supports the full humanity of 'all' CS students, including nurturing their entire self: mind, body, and spirit. This shift asks that teachers get comfortable with feeling uncomfortable as they engage in a collective struggle to create CS classrooms where all students can thrive [24].

We believe that this shift in supporting abolitionist teaching in CS for All efforts requires teacher education and professional development learning experiences that intentionally center these anti-racist pedagogies, rather than leaving them in the margins of teacher learning. Only then can we shift the professional and pedagogical discourse and practices associated with CS for All from issues of access, and towards evidence of justice.

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