

**Identifying Systemic Barriers: Computer Science District and School Policies for
African American and Hispanic Students with Disabilities**

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Abstract

Numerous Black and Hispanic Students with disabilities are confronted with systemic and policy-based challenges preventing access to K-12 STEM-related and computer science education. In this study, the African American and Hispanic Students with disabilities in Computer Science Research Alliance conducted an NSF-funded study to understand teachers' perceptions of district and school policies and practices that may hinder the participation of African American and Hispanic students with disabilities in computer science education in Central Texas. This study fills a critical gap in the literature concerning the unintended consequences affecting African American and Hispanic students with disabilities when teachers employ policies and procedures that ensure equitable access for all students.

Identifying Systemic Barriers: Computer Science District and School Policies for African American and Hispanic Students with Disabilities

In recent years there has been an enhanced interest in creating sustainable pathways to diversify STEM-related fields. These pathways begin as early as middle school and provide students with unique ways to engage in academic coursework while engaging in academically focused co-curricular experiences. The path to encourage and empower these students to participate in such encounters can be difficult for both students and family members to navigate, which has presented barriers for both Black and Hispanic students. Lack of access to programs, inadequately funded programs, and a lack of foundational technical knowledge have contributed to fewer opportunities for Black and Hispanic students to be exposed to STEM-related content in general, especially for Black and Hispanic students with disabilities.

State of Texas policy indicates that all secondary school students must be given the opportunity to select electives from a comprehensive list of course offerings (19, Tex. Admin. Code § 74.3, 1996). Black and Hispanic students with disabilities face additional challenges in accessing computer science and STEM-related courses. In contrast to their neurotypical counterparts, Black and Hispanic students with disabilities face various systemic and policy-based challenges when accessing STEM-related classes. They often encounter feelings of marginalization due to navigating through special education-related policies and administrative processes.

Efforts made to increase minority representation in STEM often ignore the intersectional nature of the disability and the barriers associated with full participation in academic settings. For students with disabilities, it is often not as simple as being presented with the opportunity to participate - the opportunity itself is only as effective as the means by which the student receives

appropriate accommodations to ensure the curriculum's accessibility.

To that end, this study focuses on the school district policies and practices that hinder students with disabilities from both enrolling in and fully participating in computer science-related courses. The overarching research question guiding this study was: "In what ways do school district policies and procedures influence African American and Hispanic students with disabilities participation in learning in computer science (hereafter abbreviated to CS) education?"

Theoretical Framework

The findings of this study were interpreted using an equity lens based on Brookover and Lezotte's (1981) educational equity framework and the Kapur Center's (2021) *Culturally Responsive-Sustaining CS Education: A Framework*. The educational equity framework supports the notion that all students necessitate equitable access, participation, and learning outcomes to K-12 computer science education, regardless of race, socio-economic, or disability status. District-level and school policies and practices were assessed by measuring levels of equity related to African American and Hispanic students with disabilities access to school offerings and programs, equal participation, and educational outcomes in K-12 computer science education in Texas. In the Kapur Center's (2021) framework, researchers noted that access and mindset are critical factors in increasing opportunities for ethnically and gender-diverse students to grow in the field of computer science. "Just 47% of high schools in the U.S. *offer computer science courses*. Black, Latinx, and Native American students and those in schools serving low-income communities are significantly less likely to have access to CS courses in their school" (Kapur Center, 2021, p.3). To address this dilemma, educators must address barriers linked to teacher mindset and low expectations, relevancy, overcoming a lack of belonging, and incorporating culturally relevant content in the

curriculum (Kapor Center, 2021; Dunbar et al., 2019).

Literature Review

There is a significant gap in the literature on studies targeting Black and Hispanic students with disabilities accessing computer science courses. A Google Scholar search of “Black students with IEPs taking computer science classes” resulted in 22,900 results. Only 15 of these studies included concepts of Black students with special education support in computer science. A search of “Hispanic students with disabilities in computer science” produced more than 81,300 results. However, less than 1% of the articles within this data set specifically targeted ethnically marginalized students who need special education support. While there is literature linked to increased accessibility for students who are visually or hearing impaired, the literature is significantly sparse regarding students qualifying for a learning disability, emotional disturbance, or students with behavioral challenges (Gottfield et al., 2016).

African American and Hispanic Students are Underrepresented in CS and STEM Education

There is a severe gap in the literature on U.S. students' early exposure, access, and opportunity to participate in CS education in school (Google & Gallup, 2016b). As such, Google commissioned Gallup to conduct a comprehensive research effort to better understand factors that influence whether U.S. students study CS or pursue careers in the field; examine perceptions about the value of CS learning among key leaders in K-12 education, and determine differences in perceptions regarding access and diversity. Google and Gallup (2016a) concede that the lack of racial diversity in the CS field in U.S. schools and the workforce is well-documented. Advanced Placement (AP) Computer Science A (a course focused on programming) participation is low overall at the high school level, but it is drastically lower for Blacks and Hispanics. For instance, 6,626

students in Texas took the AP Computer Science A. Of the test-takers in 2017, only 3% were Black, and 21% were Hispanic, with dramatically lower numbers of both Blacks (79 students) and Hispanics (674 students) when compared with the overall number of Whites (1,717, not including Asians) who passed (Google & Gallup, 2016b). These statistics reflect the current landscape of some of America's largest and more innovative tech firms, in which African-Americans and Hispanics are least represented as technical employees or in management. In addition, Pew reported that Blacks (9%) and Hispanics (7%) are underrepresented in the STEM workforce (Pew Research Center, 2018). The National Assessment of Educational Progress (NAEP, 2014) results also reported thirty-five percent of African Americans and twenty-four percent of Hispanic students performed Below Basic on the TEL, compared to nine percent of Whites. In examining student exposure to computer technology, demand for CS, opportunities to learn, and barriers, Google and Gallup (2016b) found:

- Black and lower-income students have the least access to computer science learning opportunities at school.
- Black (47%) students are less likely than White students (58%) to take CS courses in school, and regardless of income, are less likely than White or Hispanic students to report having opportunities to take classes where only CS is taught at school, as part of other classes, or at extracurricular clubs.
- Hispanic students have less access to computers with Internet access at home and use computers less at school than White or Black students.
- Only 31% of Hispanic students reported using a computer at school, compared to Blacks (45%) and Whites (40%). Students with increased access and exposure to computer technology are more confident in their skills and more likely to consider learning

computer science in the future.

Lack of Equity for Minority Students in CS Education and STEM in Texas Schools

African Americans, Hispanics, and students with disabilities (hereafter referred to as SWDs) have limited exposure to CS learning during the school day in Texas schools. During the 2016-17 school year, 37% of high schools in the state offered CS courses, and only 3.14% of high schoolers completed a CS course, with significantly lower numbers of underrepresented minorities compared to their non-minority counterparts (Code.org, n.d.; Google & Gallup, 2017).

The state's formal curriculum, Texas Essential Knowledge and Skills (TEKS), provides standards and expectations on fundamental courses in Computer Science, Career and Technical Education, and Information Technology Cluster required of secondary students (TEA, n.d.; Texas Computer Science, n.d.). In 2017, the Texas legislature passed House Bill 3593 to improve CS and cybersecurity education in high school, and the Texas State Board of Education is working on implementing a cybersecurity course pathway. In addition, the Texas Governor's office recently started an initiative, Girls Go Cyberstart, a free online game, to encourage high schoolers to build CS and cybersecurity skills. To reduce existing CS achievement gaps for this population, the AAH-SWDCS Research Alliance has a crucial equity focus to help participating Texas school districts to increase the number of Black and Hispanic students with disabilities enrolled in CS education and to build their CS learning and knowledge. It would be a mistake to ignore the interest of African Americans and Hispanics with disabilities in STEM when Texas is taking action to boost the CS skills of secondary students.

Tapping into Relevancy as a Source of Motivation

“Relevance intervention in educational psychology have helped students make connections between STEM content and their own lives” (Gray et al., 2020, p.1). The lack of focus on “adjusting the CS curriculum to fit the needs of diverse students of varying skill levels” (Hansen et al., 2016, p. 376), fuels the low graduation rate of Hispanic and Black undergraduate students in the computer science field. Relevancy can show up in many ways for Black and Latinx students to venture into a computer science pathway. Some students are motivated by their peers, encouraged by their families and teachers, and seek connections based on an increased avatar and professional representation in the computer science field (Dunbar et al., 2019; Hansen et al., 2016; Tolbert & Cardella, 2016). “Students are less likely to study computer science 1) if they do not see people that look like them succeeding in computer science and 2) if they do not perceive that they will be welcomed” (Dunbar et al., 2019, p.1). Once the additional layer of a learning disability is added to the descriptors of Black and Latinx students, the lack of relevant studies that target the motivational factors of Black and Latinx students with learning disabilities navigating computer science is minimal. Hwang and Taylor (2016) found that previous negative experiences can have an impressionable impact on student motivation. It is suggested that one way to overcome unsuccessful experiences is to use an integrated multidisciplinary approach where art is woven into computer science concepts.

Educators’ Mindset on Who is Computer Science Ready

Larios and Zetlin (2018) found that the “attitude and beliefs of school personnel can determine how a parent is accepted as a member of the IEP team and whether their participant amounts to more than just their attendance at the meeting” (p.2). The potential deficit thinking that educators have within the IEP team meeting can also impact the opportunities that students with

disabilities are provided tied to accessing computer science and other rigorous STEM courses. A lack of understanding of diverse student issues can cloud educators' assumptions about who is STEM and CS ready (Salas, 2004). "Families can serve as an important source for supporting students' aspirations toward and future participation in science STEM careers" (Wassell et al., 2015, p. 1234). Wassell, Fernandez, and Scantlebury (2015) also found the additional layer of English Language Learners increased "teachers' deficit assumptions about diverse families" (p. 1247). Thus, teachers' conceptualizations of family involvement for their students in STEM-based courses correlates with educators' negative or positive mindsets on who should access computer science opportunities. Another component contributing to the deficit mindset of educators is the lack of awareness of materials and resources available to educate students with disabilities in computer science (Gottfried et al., 2016). When educators rely on traditional math and science curriculum, along with systems that create hurdles for students with disabilities to access rigorous gateway math courses, educators' mindsets are impacted on who can and who can not be successful in computer science courses because few students with disabilities are able to meet the criteria. "To effectively include students with disabilities in CS instruction, school districts must provide teachers with the tools, supports, and resources" (Israel et al., 2018, p. 499). Targeted and ongoing educator computer science coaching and support can be a way to meet these needs.

Students with Disabilities Perform Below Peers in STEM

The results of the Technology and Engineering Literacy (TEL, a computer-based assessment with interactive scenario-based tasks), administered to eighth-graders in about 840 schools across the nation, showed significant gaps in achievement levels for SWD compared to Whites and nondisabled peers (NAEP, 2014). Fifty-one percent of SWD in eighth grade scored

Below Basic on the TEL, compared to 12% of students without disability. Inequitable access to learning opportunities and ingrained stereotypes about who can be a computer scientist may discourage some students from participating in CS (Google & Gallup, 2016a), particularly African American and Hispanic SWD. As CS education initiatives expand in K-12, one group of students is often overlooked--those with specific learning disabilities and related attention deficit disorders (Wille, Century, & Pike, 2017). The underrepresentation of students with disabilities in CS education is a problem that has not garnered adequate attention in K-16, and it is critical to increasing their participation in a meaningful way, not just about access and quantity (Ladner & Burgstahler, 2015). It is imperative that we build and sustain the interest, learning, knowledge, and persistence of African Americans and Hispanics with disabilities in CS education.

Methodology

This research was conducted by the African American and Hispanic Students with Disabilities in Computer Science (AAH-SWDCS) Research Alliance as part of an NSF-funded study on teachers' perceptions about the barriers to increasing computer science (CS) awareness among African American and Hispanic students with disabilities (SWD). The AAH-SWDCS Research Alliance, a research-practitioner partnership consisting of computer science and special educators in Texas school districts, as well as researchers, and evaluators. To answer our overarching research question, a convenience sample of 10 teachers, including both computer science and special education teachers participated in a series of three focus group interviews in Years 1 (Spring 2020) and 2 (Fall 2020, Spring 2021). The focus group interview protocol, approved and amended by Texas State University, included questions centering on the teachers' perceptions of their own experience within the AAH-SWDCS research alliance, and information

regarding their perceptions of students' experiences in the program.

Data Analysis and Trustworthiness

Data were analyzed using Braun & Clarke's (2006) six-step thematic analysis process following an inductive thematic analysis approach. First, the interview scripts were read for familiarity. Second, a list of codes derived from the interview protocol and research questions were manually entered into a Microsoft Excel document. Third, an inductive process was employed to code interviews by manually organizing participants' quotes under each associated code in the Excel document, and Open Coding was performed by adding new codes as needed while reading the interview transcripts (Saldaña 2012). Fourth, the list of codes were reviewed and refined. Fifth, high-level themes were identified and the codes and the associated quotes were manually regrouped under these themes. Finally, the final report of emergent themes with the associated participants' quotes was produced. The coding results were verified by another researcher who reviewed the emergent themes and related quotes. A second iteration of coding was conducted to identify sub-themes. Finally, the focus group transcript was loaded into the NVivo qualitative data analysis software to ease accessibility for comparison with future studies.

Data triangulation methods (Brantlinger et al., 2005) and member-checking (Creswell, 2014) were employed by emailing the participating computer science and special educators a copy of the transcripts to obtain their feedback. Inter-rater reliability analysis revealed a 100% agreement between coders.

Results

The findings from the teacher focus groups resulted in challenges at every step of the

matriculation process for students with disabilities attempting to access computer science programs. Teachers discussed 1) the administrative barriers associated with the students enrolling in the programs, to begin with, 2) the challenges associated with implementing computer science-related interventions for students with disabilities, and lastly, 3) the lack of culturally relevant computer science pedagogy directed at meeting black and Hispanic students with disabilities needs.

Enrollment Issues

Teachers discussed the multiple systemic barriers associated with enrolling students with disabilities in computer science courses. For example, school district policies and administrative practices specific to scheduling routines and the process by which students select electives were listed as significant impediments to enrolling black and Hispanic students with disabilities into computer science-focused programs. This barrier was broken down into two specific issues: 1) scheduling and staffing conflicts associated with therapy/disability-specific services and the time at which computer science-related courses are offered and 2) lack of counselor support.

Staffing & Scheduling Issues: Beyond the efforts to provide students with the resources they need in order to navigate computer science-related courses successfully, teachers discussed the challenges associated with simply getting the classes on the school schedule. Teachers mentioned the lack of available staff, resulting in fewer sections of computer science-related class sections being made available.

We need more staffing so we can offer more sections. Um, cause I think that's the issue like we have, it's kinda like why then, like we have one, if you're in sixth grade, you get this one class it's one time, and then we just have one teacher that does all other ones. So that lessens the amount of sections that can be offered to, I say, it's by grade levels though.

This lack of staffing also results in the possibilities for more conflicts between required disability-specific services and computer science courses, thus resulting in students with disabilities simply not having the time in the day to participate in computer science-specific courses.

And so sometimes their disability may limit them because of their class schedule to where they may not even be. It's not that it's not offered. It's just, what's the likelihood that that student, depending on what services they receive, could end up in that class.

“I think at a middle school level, a barrier would be if they are receiving certain services that take away an elective, so to speak, then they don't have that. They lessen their chance of being enrolled in that class because they're having to meet other needs if that makes sense”

Counselors as Gatekeepers: In considering the process by which students with disabilities are provided the opportunity to participate in computer science-related courses, school counselors were mentioned by teachers as being the key gatekeepers to class enrollment. Indeed, the teachers mentioned that counselors have preconceived notions about whether black and Hispanic students with disabilities could succeed in computer science-related courses and frame their decisions on supporting students choices with those frameworks in mind.

If they could see for themselves kind of what's going on in that class, they could better match a kid in the course. Like it wouldn't just be like an assumption that is too difficult. Um, and I think them knowing a student and kind of their work ethic and what they're capable of could be a benefit, you know, once they actually have a clear understanding of the course itself versus just like a written description.

The perceived conflict between teachers and counselors was mentioned frequently as a key barrier to enrolling black and Hispanic students with disabilities into computer science classes. Teachers mentioned that attempts they made to bridge the gap were met with a lack of interest:

And I, I, uh, asked one of our counselors, the main counselor a couple of times. I was, I wouldn't mention for the, we were doing these meetings and if she had time to join us,

Uh, Nope. So I don't know how to even approach the counselors to tell them how important this is for our kids.

Curriculum Inaccessibility: Lack of Inclusion Support & Culturally Relevant Pedagogy

The next inherent step in the matriculation process is ensuring that students have the tools and resources to succeed in the classroom. The teachers in our study indicated a significant lack of specialized and individualized curriculum designed to help black and Hispanic students with disabilities access the material and be successful through the process.

Lack of Disability Specific Inclusion Support: Teachers focused on two contributing vectors to the lack of inclusion support: 1) a lack of electives taught using inclusive strategies, and 2) a lack of training for teachers to understand how best to support their disabled students. Inclusion support, from the lens of the teachers, was defined as differentiated instruction, adapted curriculum, and 504 specific accommodations intended to make the curriculum more accessible to students. One teacher specifically said:

So that is a, a such a valid point to bring up just okay, they get in the class, but with supports are in place for the teacher, that's teaching the class and the student that's trying to learn in that setting as well, because there is no inclusion and no inclusion electives. Last time I checked.

Moreover, teachers felt that they weren't prepared effectively to provide support to students with disabilities. Teachers discussed the lack of both formal training and structuralized opportunities to work with special education teachers to support students in the classroom:

“And then if they're not, and they're just not of a program, it needs to be a change to where we can get someone to actually co-teach with a regular computer science teacher, because otherwise if it's not Saturday program, they're not going to be able to work with those kids. They need constant redirection.”

“I think it's the same way because our computer science teacher, I don't think she would be prepared to work with our special education students and special education program.”

Lack of CS-Focused Intervention for African American and Hispanic SWD: The second barrier to full participation in related courses was a lack of culturally focused interventions focused on meeting the needs of Black and Hispanic students with disabilities in computer science. Teachers discussed an inherent lack of computer science-related courses for all students and shared concerns that computer science was not thought of as an important component of the core curriculum:

Yeah. I would agree with that also just basically make it a core subject in computer science core subjects. I think, uh, I think it does important as math reading so interested in science and just by making it a core subject we'll have because it comes down to staffing your limited number of spots like Ms. Noble said, you know, a hundred students about 150 students might be able to take that technology course.

“I think in addition to that, um, different districts have different initiatives and I know that our school district has vocalized, but I don't know that we've actually taken any action on trying to integrate different types of computer science concepts K-12 or at least K-8.

And specifically, within this overall lack of computer science-related interventions, teachers discussed the lack of special attention to the needs of diverse populations, in some sense creating a cyclical pattern where a lack of differentiated instruction, leads to underrepresentation, which in turn leads to counselors (who as mentioned above assist students in their elective choice decision making process) not encouraging black and Hispanic students to attempt these courses.

So for example, a teacher referenced an opportunity students had to interact with computer science professionals but mentioned that the mentors, brought in to encourage students to pursue computer science-related fields, did not represent a diverse population:\

I think so support, which we talked about in our meetings before we went live with the kids, was about bringing in representation for them to actually see and talk to. And we did have the mentors come in, but those mentors didn't necessarily look like the kids in the

rooms.

Lastly, given the overall lack of opportunities for students to pursue computer science-related courses, and the even smaller opportunities for Black and Hispanic students to pursue STEM-related programming, teachers again pointed to counselors as a key constraining factor in ensuring that these diverse populations are represented in classrooms.

I think that's where we need to really, really talk to them [counselors], and have the counselors understand that even our special education kids or our Hispanics and black kids need to be in those classes

Discussion & Implications for Practice

School and District Computer Science Policies and Practices

The results from this study reveal the typical challenges that school districts face: district administrators often have access to worthwhile initiatives but few resources to implement them (Israel et al., 2018; Gottfried et al., 2016). Often, school districts may overcommit and are unable to deliver on initiatives because of limited funding. While the teachers in this study expressed their commitment to participating in this project, they also recognized intrinsic and extrinsic barriers that may impede the participation of African American and Hispanic SWD in CS education (Wassell et al., 2015; Shifrer et al., 2013; Bianco, 2005).

Additionally, these findings suggest that teachers believe that counselors serve as gatekeepers, which may not be consistent with school and district policies. Per the school policy, SWD can choose their own classes, which counters the notion that counselors control class enrollment. Frequently, students' low perceptions about their abilities and disinterest in CS may influence their lack of participation in CS classes (Gray et al., 2020; Hwang & Taylor, 2016). We propose further investigation on the factors that influence African American and Hispanic SWD decisions to enroll and participate in CS education to more accurately reflect the course selection

process for SWD. For example, special education case managers may benefit from participating in a “learning walk” rather than counselors because they “case manage” a group of 10-20 special education students to ensure they are meeting the goals of their individualized education plans (IEPs). Our findings may reveal that CS and special educators have a knowledge gap about counselors’ role in the course selection process and their level of specialized training and expertise, and this knowledge gap contributes to fewer opportunities for minority students with and without disabilities to participate in STEM-related courses.

Adapting Curriculum/Inclusion Support

As referenced in our literature review, African American students are underrepresented in STEM-related courses, and students with disabilities typically perform below their peers in these same courses (Kapor Center, 2021; Pew Research Center, 2018). It is, therefore, logical to assume that disabled students of color will face tremendous difficulty navigating through STEM-related fields. Moreover, despite federal law requiring students with disabilities to be provided with adequate supports and structures to provide the opportunity for equitable success, students still struggle due to a lack of teacher cross-training and teacher preparation. This is understandable, given the framework of remediation that often pervades the special education system.

Black students, specifically, are overrepresented in special education due primarily to the overdiagnosis of problematic behavioral issues (Ford & Russo, 2016; Jordan, 2005). This, in turn results in school special educators and administrators focusing on behavioral-related supports for the student, instead of the possibility of shifting teaching modalities and offering students the different platforms by which to engage with the content provided.

Moreover, even when given the opportunity to explore STEM-related fields, the participants in our study indicate that teachers are simply not prepared to provide the necessary

adaptive support to bridge the gap between the standard method used to teach STEM-related fields and tools used to accommodate students with disabilities. Teacher cross-training, structured/intentional inclusion support, and an emphasis on electives being available and accessible to all students would go a long way in attracting new students to STEM-related fields and supporting the minority groups currently in these classes.

Our findings reveal SWD may face challenges associated with comprehension of abstract CS concepts. As a result of COVID-19, many school districts have required distance learning, which has exposed computer knowledge gaps among African American and Hispanic SWD. The teachers indicated that limited staffing is a barrier to offering more CS class sections by grade level.

We posit that computer science teachers are general education teachers, while special education teachers focus on supporting SWD. Per policy, special educators are not responsible for teaching CS concepts to SWD. In general education classrooms, CS teachers teach this subject to all students, including SWD. Special education teachers should supplement and provide support to ensure that SWD is successful in CS. Our findings may reveal a mismatch in CS and SPED teacher roles during the AAH-SWDCS Alliance compared to their school or district positions, which underscore the previous result related to school district challenges in implementing worthwhile initiatives but have few resources. Typically, school districts let their general interests drive action. In increased CS education for African American and Hispanic SWD, school and district leaders may not understand the initiative or be more invested in other programs preventing them from allocating sufficient resources. Administrators do not actively implement these initiatives due to limited resources.

This topic area and theme's initial intent was to understand the function of mentors and role models as an intervention to increase African American and Hispanic students' interest in CS and careers. However, the research question primarily elicited responses related to the resources needed to facilitate interventions for the intended audience. Our findings revealed the need for current CS majors and recent college graduates to serve as role models for African American and Hispanic SWD because they can provide more context about CS and AI careers and what to expect. The teachers also recommended that administrators secure additional resources to engage SWD in the classroom, such as robotics and computer programs. These teachers also discussed their practices to improve student engagement during the current intervention. They sourced videos on AI bias to engage students and suggested that we reduce the current class time to provide flexibility for students who work on the weekends. These suggestions may be helpful when planning for future iterations of the current intervention.

In addition to professional role models, school administrators must also realize that *in-class* representation matters as much as professional representation. Students want to see models of success not only from fully formed adult professionals but also from peers who are from similar backgrounds (Moreno Sandoval et al., 2021; Dunbar et al., 2019; Hansen et al.; 2016; Tolbert & Cardella, 2016). The best method of creating sustainable pathways for Black and Hispanic students with disabilities to access STEM-related fields should rely heavily on the demonstrated success of Black and Hispanic students within STEM-related classes. This can only occur if school district administrators and teachers discard preconceived archetypes for model students enrolled within those programs.

Conclusion

Issues related to access are typically systemic and involve rules and regulations as much

as individual actors. Moreover, ableist barriers are often the result of well-intentioned policies and the allocation of resources. There is certainly no doubt that the schools and districts represented in our study have the best interest of their students at heart; however, extant policies and procedures, many of which have gone unchanged for years, are the reason that Black and Hispanic students either cannot access STEM-related courses or are not set up for the best possibility of success when they do have the opportunity to enroll in such classes.

This study has a few limitations. First, the findings were all based on interviews with teachers in the same geographic area who shared their perceptions of student experiences. Teachers also may have felt uncomfortable sharing uncensored thoughts on school and district policies for fear of job-based retaliation. The most significant limitation for this study was related to COVID-19. At the onset of the study, meetings and training with teachers were in person. Thus, teachers were working with their students on a face-to-face basis. Due to COVID-19 related gathering restrictions and school closings, all operations shifted to being online--meaning teachers were attempting to teach computer science online while making disability-specific accommodations on an online platform. This certainly created some unique challenges that are likely represented in our data.

A key takeaway of this study is for district administrators and teachers alike to be keenly aware of unintended consequences when policies and procedures are not appropriately vetted to ensure equal access for all students. In addition, commitment to inclusion has to extend beyond actions and must include the philosophies and organizational structure that undergird the systems the students participate in on a daily basis.

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