

**TECHNOLOGY AND COLLEGE ACCESS:
*UNDERSTANDING THE UNIQUE
CHALLENGES AND OPPORTUNITIES
BLACK STUDENTS FACE***

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ABSTRACT

Black youth are less likely to enroll in college than youth of other races. The disparity in college access, and subsequently, in degree attainment, is due to many systemic and structural factors. Information gaps about how to research, prepare for, and finance a college degree also lead to racial disparities in college access. Technology, including computers, the Internet, and social media, has increasingly become a vector for college knowledge. In this report I argue that educators might leverage Black students' significant use of and innovation with technology to expand opportunities to cultivate college knowledge and expand college access. In this brief, I highlight the relationship between technology and college knowledge, explore the barriers that Black youth may encounter in using technology to research and prepare for college, and offer an assets-based approach to understanding how Black youth learn, innovate, and create with technology. I conclude with recommendations for policymakers and practitioners who seek to expand Black students' college access.

INTRODUCTION

A college degree has long been thought of as a pathway to social and economic advancement. Workers with Bachelor's degrees report more consistent employment and greater lifetime earnings than those without degrees. Despite the benefits of degree attainment, racial disparities persist. In 2018, 59% of Asian young adults were enrolled in college, compared with 42% of Whites, 36% of Hispanics and 37% of Blacks (National Center for Education Statistics, 2020). While academic preparedness, economics, and other systemic barriers play a role in these gaps, scholars have noted that access to information about college also is an important factor in these disparities (Bell et al., 2009). Students, especially those who are first-generation college students and/or are from low-income backgrounds, may lack information about how to calculate the net price of a college, how to identify the differences between colleges (i.e. small liberal arts colleges vs. flagship public universities), and how to find information about whether or not a college fits their academic, economic and interpersonal needs (Hoxby & Turner, 2015). These information disparities have a particularly damaging impact on underrepresented students. Researchers have found that even when low-income youth and youth of color are academically prepared for college, they may not apply to selective institutions, or they may not apply to college at all (Hoxby & Turner, 2013).

Over the past 20 years, the Internet has become an increasingly important vector for cultivating college knowledge. Tierney, Corwin, and Oschner (2018) argue that the Internet has the potential to democratize access to information and help build college knowledge among underrepresented groups, yet digital equity issues pose challenges in doing so. Students can use websites, mobile applications and social media to access immediate information related to their questions about college. For students who may lack access to college information from parents, peers and college counselors, digital tools can be an asset during their college preparation process (Tierney et al., 2018). Still, the Internet is not a panacea for information gaps. There are disparities in technology access and use that impact how Black students learn about postsecondary pathways, and I explore them in this brief. To address these challenges, I recommend that education stakeholders view Black youth not only through the sum of the challenges they face, but through the assets

they bring to technology-based learning, including their role as innovators and superusers. I encourage policymakers to consider expanding Internet access by addressing costs, competition, and structural barriers to Internet access, and by expanding the scope of the federal e-rate program to provide students with greater access to technology. I encourage practitioners to continue to focus on developing the digital literacy skills that would increase access to postsecondary information. The information can be used to develop high-tech and low-tech interventions that can expand college access for Black youth.

CULTURALLY MEDIATED USES OF TECHNOLOGY

Like all youth, Black youth use technology in ways that reflect their culture and context. Andre Brock (2012) argues that Black users engage with Twitter in a unique way that is reflective of their cultural background. Black Twitter users connect on the social networking site through engaging in culturally rooted communication practices like signifying, a process of expression, reflection and meaning-making that involves witty speech, double entendre, and comedy. In addition to signifying, Brock (2012), Manjoo (2010) and others have argued that the ways in which Black people use hashtags, @s, and memes to share information, raise awareness, and engage in public conversation has had an impact within and beyond the Black community. For example, the social movement and phenomenon known as #BlackLivesMatter began as a hashtag on Twitter. Twitter is not the only place where Black youths' unique social media practices are on display. Vine, a video-based mobile app run by Twitter that existed from 2012-2016 gained international popularity in large part through the work of Black teens. Several Vine videos created viral moments that remain in the popular lexicon to this day. Despite the nuanced and culturally rooted ways in which Black youth engage with social media, researchers have yet to consider en masse how these practices impact Black youths' use of social media to engage in discussion and research around college.

WHAT IS COLLEGE KNOWLEDGE?

Roderick, Nagaoka, and Coca (2009) argue that college readiness requires four essential sets of skills — content knowledge (i.e. expertise in core subjects — math, science, literature, social science), core academic skills (i.e. writing and analytic thinking), non-cognitive skills, and college knowledge — the ability to effectively search for and apply to college. College knowledge includes awareness of college admissions, financial aid, and enrollment processes, as well as awareness of college norms and culture. College knowledge also entails understanding how postsecondary choices might impact a student individually.

There are many vectors for college knowledge. Social relationships with parents, family members, and friends are typically the primary way in which students learn about post-secondary options. However, the networked nature of college knowledge presents a particular challenge for first-generation students. If students do not have close relationships with others who have gone to college, they may have limited opportunities to learn about higher education. Still, there are other important sources of college knowledge that may be more broadly accessible to first-generation and underrepresented students. Teachers, college counselors, mentors, and community leaders also play a role in helping students build college knowledge (Belasco, 2013; Corwin & Tierney, 2007). Some youth also learn about

higher education through their involvement in intervention programs like the Federal TRIO programs (Upward Bound, Gear Up, Talent Search), college preparatory middle and high schools – some of which offer dual enrollment, and Early Assessment Programs (EAP) that assess readiness for enrollment in state university systems (Venezia & Jaeger, 2013). Colleges themselves also play a role in helping educate prospective students about post-secondary options. Institutions may send admissions counselors and recruiters to high schools to educate students about their offerings. Schools also offer campus tours for prospective students that are able to travel to their campuses.

Black Students and College Knowledge

College knowledge involves a broad set of general information about college, as well as awareness of how to acquire that specific information and apply it to one's personal context. However, Black students may have some unique concerns about college that may not impact their non-Black peers. For example, Black students may want to know about an institutions' racial climate, and the experiences of Black students both on campus and in the community that surrounds the campus. Toward that end, they may also want to know about the experiences not only of other Black students at a particular institution, but of Black faculty and staff as well. Black students may want to know about the engagement and retention offerings on a particular campus, and what type of community they might expect to connect to at different schools. They may also be interested in the presence and salience of different affinity groups, including historically Black sororities and fraternities. Because African Americans are disproportionately saddled with student loan debt, Black students may want to know about campus-specific scholarships for underrepresented students.

TECHNOLOGY AND COLLEGE KNOWLEDGE

Over the past 20 years, technology has become an important vector for transmitting college knowledge. Whereas institutions in the past would send out view books to provide institutional profiles, the college website is now one of the most widely consulted resources for students seeking college information (Saichaie & Morphew, 2014). College websites communicate information about academics, campus aesthetics, fine arts, intercollegiate athletics, student life, and values (Saichaie, 2011). In a Chegg survey, 36% of high school students visited college websites weekly and 21% visited daily as they were applying to colleges (Noel-Levitz, 2015).

Schools are utilizing the internet in other ways as well. Social media has become an increasingly important component of university marketing plans. Social media is relatively cost efficient when compared with print media, and it is easily accessible, particularly to traditionally college aged students. Social media also allows schools to quickly disseminate information that may be of interest to current and prospective students, including updates about athletics, academic offerings, and student life. By using social media, schools can also cast a broad net for engagement, and make immediate connections with students across the globe. The quick and constant stream of data about user behaviors can also theoretically allow universities to develop customized marketing strategies. Instagram in particular has become a popular way for colleges to interact with current and prospective students. The visual nature of the mobile application allows schools to highlight their most attractive features, including location and facilities.

Universities aren't the only ones using technology to transmit college knowledge and to help prospective students make decisions about higher education. There is a large industry of college and scholarship search websites that allow students to find information and resources about college. The College Board and other organizations have websites that function as one stop shops for college information that features a variety of resources designed to help students make postsecondary decisions, including quizzes along with college search and comparison tools. Test prep organizations like Princeton Review use the Internet to help students take practice tests and store and analyze their test data. Scholarship search engines like Fastweb are another way in which college prep providers have used the Internet to engage students. College prep websites may be free for students to use, but generate revenue through advertising. Some of these sites also collect student data and sell it to third party sources, including colleges and for-profit organizations.

Mobile apps are another way in which colleges, nonprofit groups and for-profit enterprises are attempting to help students make decisions about college. A report by the Pullias Center for Higher Education (2018) analyzed over 50 mobile apps and websites optimized for mobile that provided college knowledge. These tools covered a wide range of topics, including applying to college, exploring and comparing different campuses, college coaching and mentoring, and financial aid and scholarships. The proliferation of these tools is another example of the increasing interconnectedness between technology and college access.

Websites, social media, and mobile apps are powerful tools that can play an important role in helping students gather basic information about college, including size, cost, location. These tools can also help students manage deadlines and materials, and keep track of various aspects of the college preparatory process. They can also help students gain some basic insights into campus culture and into student life. There is a caveat, though. These tools may lack enough culturally relevant and context specific information to meet Black students' needs. Before I explore the limitations of technology for college knowledge, I turn my attention to two barriers that Black youth encounter in using technology to prepare for college—access and skill.

BARRIERS TO USING TECHNOLOGY FOR COLLEGE KNOWLEDGE:

ACCESS

The history of the digital divide in the United States has been long documented. There have been disparities in access to high speed Internet since its inception. Access to computers, tablets and smartphones also varies by race and socioeconomic status. According to a report by Future Ready Schools using the 2018 American Community Survey (ACS), 22.7% of American households nationwide lack access to high speed Internet, and 9.8% lack access to computers. For Black households, these figures rise to 30.6% and 17.2%, respectively.

Smartphone use, however, is widespread among all American teens, including Black teens. 94% of Black teens have access to a smartphone. While 23% of Black adults report being smart phone only users, it is unclear how many Black teens rely exclusively on smartphones for Internet access. However, if they are, it is important to note that mobile-

only use may present some challenges, particularly for learning. The limited functionality of smartphones may make complex calculations and detailed writing difficult. Engaging in activities like essay writing for a personal statement may be difficult on a smaller device like a mobile phone. Additionally, students may encounter data caps or usage fees on smartphones that can make it difficult to use them for learning.

Lack of Internet and Device Access by Race and Ethnicity

	Households without computers - Nationwide	Households without computers - California	Households without high-speed home Internet	Households without high speed home Internet - California
All	9.8%	8.2%	22.7%	19.9%
Asian	3.5%	2.3%	12.3%	11.2%
White	7.9%	7.3%	20.9%	19.0%
Black	17.2%	11.5%	30.6%	22.9%
Latinx	17.0%	13.6%	31.2%	28.3%
American Indian/ Alaska Native	15.8%	10.9%	34.2%	27.1%

Table 1. Households in California Without Computers and High-Speed Internet

Source: https://futureready.org/wp-content/uploads/2020/08/HomeworkGap_FINAL8.06.2020.pdf

Disparities in computer and Internet access as well as overreliance on smartphones to access the Internet have significant impacts on learning. Educators have noted that there is a “digital homework gap,” whereby some students lack the technologies necessary to complete school assignments at home. A PEW survey conducted in 2018 found that 25% of Black teens were unable to complete homework assignments due to no access to a reliable computer device or Internet connection at home, and 30% relied on smartphones to complete assignments (Auxier & Anderson, 2020).

Schools, community groups, and nonprofit organizations have often worked together to provide workarounds to the lack of technology access and the subsequent homework gap by providing access to computers and the Internet including libraries and after school study spaces. Still, these supports have not been accessible to all students. 21% of Black youth relied on public Wi-Fi in spaces like coffee shops and libraries to do homework because they lacked a stable home Internet connection, compared to 11% of White teens. Relying on public Internet can present challenges for students, health, wellbeing, and safety, as well as persistence and retention. According to a piece published on the National Education Association’s (NEA) website (McLaughlin, 2016, para 4):

The homework gap forces students in these households to head over to the library to squeeze in two more hours of homework instead of going home for dinner after a long sports practice. Some may decide to forgo the safety and warmth of their home to venture out to the commercial parking lot with free Wi-Fi access in order to complete and submit their assignment. Or many students are simply unable to finish the work.

At first glance, it is easy to understand the digital divide as an economic issue. However, Turner (2016) found that socioeconomic status isn't the only factor that contributes to the digital divide. For families in the lowest-income quintile of \$20,000 or below, 58% of Whites have home internet access, while 50% of Blacks do. Income, then, is not the sole reason for internet disparities. According to Turner (2016), Hispanics, Blacks, American Indians and Pacific Islanders in urban areas have fewer choices for the Internet than Whites and Asians do. Even in rural areas, Whites enjoy more choice of internet access than Blacks do.

People of color are more likely to live in areas where there is a monopoly on Internet service. These disparities are the result of digital redlining—racialized and income-based discrimination in broadband access. A report by Connect Your Community and the National Digital Inclusion Alliance alleges that Internet Service Providers in Cleveland, Ohio made deliberate decisions to divest in infrastructure upgrades in high poverty neighborhoods, leaving them without access to high speed Internet (Callahan 2018, 2019). As practitioners seek to expand access to the Internet, they should also consider the structural conditions that contribute to disparate Internet access in the first place. In the recommendations section, I provide suggestions for policymakers and practitioners who wish to close the digital divide.

BARRIERS TO USING TECHNOLOGY FOR COLLEGE KNOWLEDGE: DIGITAL LITERACY

Access to computers and to the Internet are prerequisites for research, connection, and communication. However, closing gaps in computer and Internet access are only the first steps toward building students' capacity to use technology to acquire college knowledge. Educators must also address gaps in skill that make finding and making sense of online information difficult for some students.

Digital literacy refers to the complex set of cognitive and technical skills that are needed to obtain and make sense of online information. In "Digital and Media Literacy: A Plan for Action," Renee Hobbs (2010) identifies five competencies that work together to support digital and media literacy—Access, Analyze & Evaluate, Create, Reflect, and Act. According to Hobbs' framework, students with media and digital literacy skills will be able to use computers and the Internet to access relevant information, and to analyze and evaluate this information for quality, veracity, credibility and point of view. Students will also be able to use technology to confidently express themselves in purposeful, audience appropriate ways. Students will be able to reflect on ethical and socially responsible ways to behave online, and to take action to solve local and global problems.

Margolis et al. (2017) found that Black students' access to computer science education was far different than their non-Black counterparts. Their research uncovered "virtual segregation" in Los Angeles public high schools, where Black students in low-income schools had access to only introductory computer classes, while students in wealthier, whiter schools had access to advanced computer science classes. Margolis et al. (2017) found that the few students

of color who had access to these courses often did not enroll in them, due in part to a lack of encouragement from institutional agents and a less than supportive climate in the classes. Puckett (2019) and Rafalow (2020) have focused on digital skill building more broadly, and found that students across the board have limited opportunities to build digital literacy skills. They find that schools provide very different opportunities to teach digital skills, largely dependent on their demographics. Rafalow (2020) notes that schools serving students of color might deprioritize more complex digital skills in favor of typing, coding, and website making.

While the relationship between postsecondary knowledge acquisition and digital literacy is often overlooked, several scholars have considered some important aspects of this relationship that deserve further consideration. In a longitudinal study, Venegas (2006) found that many students lacked the prerequisite digital literacy skills needed to successfully use the Internet to learn about admissions and financial aid requirements. Her study reflected a nuanced portrayal of the digital divide, where students had access to technology, but struggled to use some facets of the Internet for a detailed search for resources. Venegas (2006) found that students could find general websites about college, but they had difficulty navigating institution specific web portals. Students also struggled with what Venegas called “catchall” sites, websites that might offer a broad range of information about college, including admissions requirements, campus profiles, scholarships, and financial aid. Brown, Wohn, and Ellison (2016) also found that the complexity of the Internet could be a deterrent for some students. They found that while many students use the Internet to engage in purposeful, targeted information-seeking about college, some students struggle with making sense of what they find online. The students in this study relied on school leaders and community members to act as “knowledge translators” who helped students interpret information they accessed online. While this is not necessarily a problem, students who lack access to individuals who have enough familiarity with postsecondary education to serve as knowledge translators might be at a particular disadvantage when trying to use the Internet to learn about college.

BARRIERS TO USING TECHNOLOGY FOR COLLEGE ACCESS – LIMITED NETWORKS

Students’ peer and familial networks influence the types of information they have access to, as well as how they might make sense of information they encounter online. However, technology offers a pathway for students to extend beyond their immediate social networks, and to manage what sociologists call “weak ties.” Social media in particular offers youth with a way to create and maintain relationships with people they may not know directly or with whom they may not have frequent contact with. These weak ties can allow students to widen their social networks, which in turn can lead to increased information sharing and greater social capital (Greenhow & Burton, 2011).

There is evidence that youth are increasingly using social media to acquire college knowledge (Rowan et al., 2016). In a survey of nearly 2,000 students, Rogers (2016) found that four in five students watched videos from colleges, 32% used hashtags to research schools and 20% posted questions about college to social media sites. 41% of students said social media was very or extremely useful in finding information for college (Rogers, 2016). In addition to using social media as a source of information about post-secondary options, some students may use it as a source of social support. Wohn et al. (2013) found that social media helped first-generation students maintain relationships with college graduates, which increased their college application efficacy and their expectations of college success. Wohn et al. write that Facebook in particular allowed students to see positive examples of people from similar backgrounds who graduated from college, which in turn increased the confidence of first-generation students. However, the study also found that for students who were not first generation, increased use of social media actually decreased their expectations of college. Jeon et al. (2013) found that social media can help first generation students who are applying to college by helping make their college support networks more visible. The authors found that an experiment which asked students to reflect on available and reliable Facebook friends with some level of college expertise helped students activate vital aspects of their virtual network. The authors argue that similar interventions, where educators and researchers simply remind first generation students of their preexisting college support network, can have a positive impact in students' postsecondary preparation processes.

TECHNOLOGY LIMITATIONS BY DESIGN

By focusing on digital literacy, we might consider whether or not youth have the prerequisite skills to find and make sense of relevant information regarding college. By focusing on network barriers, we may consider how students' social networks may or may not support their access to college knowledge. While these are important areas to consider, it is also important for practitioners and policymakers to note that limitations to using technology for college access do not only reflect students' skills and networks, they reflect the limitations of technology itself.

Saichaie and Morphey (2014) focused on how technology itself might make decision making difficult. They found that college websites may be difficult for casual users to meaningfully analyze. After doing a content analysis of 12 college websites, they concluded that colleges strive to present information in a broad and universal way, so as to appeal to a wide cross section of diverse students. The challenge with this is that because college websites look so similar across institutions, students may struggle in identifying crucial differences between schools. Additionally, because information is presented in a broad and universal way on college websites, it is hard for students to figure out how a school might meet their specific needs. This presents significant challenges for underrepresented students, who may have questions about how an institution would specifically meet the needs of a person from their racial and/or socioeconomic background.

The Pullias Center's (2018) analysis of college websites and mobile apps aligns with Saichaie and Morphey's (2014) assertions regarding the relative homogeneity of college's digital media. After assessing 50 popular college websites

and mobile apps, the writers found that while there are many tools on the market for students, these tools cast a wide net in both the information they provide and the audiences they cater to. They write:

Many tools, because they are for-profit, cast a wide net and are therefore not intended to address the needs and information-gaps of a low-income audience. Those that do target low-income students tend to focus on high achieving low-income students, attempting to solve the 'undermatching' problem. Few sites target "average" low-income students who aspire for college. (The Pullias Center for Higher Education, 2018, p.7)

The challenges that the Pullias Center's report highlights around digital tools are ones that cannot be overcome through increased digital literacy alone. These data suggest that, even if students use certain tools, the information they seek may not be available through these means. Whether intentionally or not, these tools are designed around students who are White, middle class, and high achieving. Students who do not fit into one or more of these categories may find that these tools lack enough nuance to be personally applicable. While Black students can still use these tools to glean some information from them about college, the tools alone may have limited effectiveness in helping Black students make postsecondary decisions. As we strive to strengthen students' digital literacy skills, we must also strive to strengthen the digital tools that students have access to, something I explore in the recommendations section of the report.

UNDERSTANDING BLACK STUDENTS' EXPERIENCES USING TECHNOLOGY TO BUILD COLLEGE KNOWLEDGE: AN ASSETS-BASED APPROACH

Because first generation youth, low-income youth, Black youth, and youth that transgress all three categories use tech in ways that are different and not often widely understood, more research needs to be done about their unique experiences in living and learning with technology. As Tichavakunda and Tierney (2018) note, many information and communications technology (ICT) researchers lump black youth in with underrepresented students, and fail to capture the uniqueness of Black students' experiences. This is a significant oversight, and one that will hamper efforts toward tech-based college access interventions. If we do not know Black students' unique experiences, how can we meet their specific needs?

The report thus far highlights many areas of inquiry for researchers and practitioners as it relates to the information seeking behaviors of Black youth. While it is tempting to focus solely on the challenges that Black youth face, education stakeholders may find overlooked opportunities for supporting Black youth by using an asset-based approach to understanding their experiences. An assets-based approach would view Black youth as more than the sum total of the challenges they experience or the structural barriers they face. Instead, an assets-based approach would consider Black youth as self-directed technologists and innovators who are leading the way with regard to creative uses of technology.

The need for such an approach is driven by data. A study by The Associated Press-NORC Center for Public Affairs Research (Whack, 2017) found that 9 in 10 black teens used snapchat compared to 7 in 10 white teens. Black teens were twice as likely as whites to use snapchat constantly, and 1/3 of black teens said they used Instagram constantly as well, compared to 1/5 white teens. Messaging apps were also widely used by Black teens, with 18% of them using five or more apps (i.e. WhatsApp or Kik) compared to 6% of white teens.

Not only are Black youth more likely to use social media, they spend more time interacting with social media and other forms of media than their non-Black counterparts. In their nationally representative study of over 2,000 youth, Common Sense Media reported that “Black youth report spending substantially more time with media than white or Hispanic youth.” In this study, media included TV, the Internet, video games, social networking sites, listening to music and reading.

Teens' Technology Use by Race

	All	Black	White	Hispanic
Teens' website use by race	:36	:43	:42	:40
Teens' social media use by race	2:04	2:59	1:54	2:00
Teens' screen time by race	7:07	8:53	6:46	6:51

Table 2. Source: Rideout, V. (2015). The common sense census: Media use by tweens and teens (Rep.). Retrieved January 5, 2021, from Common Sense Media website: https://www.commonsensemedia.org/sites/default/files/uploads/research/census_researchreport.pdf

An assets-based approach would allow researchers and practitioners to leverage the opportunities presented by Black youths' unique experiences as technology and super users. For example, while mobile-only technology use is typically framed as a deficit, it could be an opportunity for creative educational delivery. Mobile technology allows users to make connections that are both intimate and constant. Given that 94% of Black teens have access to smartphones, technologists should consider how they might create culturally relevant mobile applications for this population. For example, educators and technologists might develop applications that connect Black students with knowledge brokers in their community who could elaborate and contextualize college information. Innovators might leverage mobile to send Black youth college information and direction that is time-sensitive, context-specific and culturally relevant.

An assets-based approach would also view Black youth not only as technology consumers, but as innovators. Here's how one of the lead researchers on PEW's nationally representative technology surveys described Black teens, “They're first-movers, in many ways,” said Amanda Lenhart, the lead researcher on the poll, whose work has focused on teenagers and social media use. “It speaks to the level of embeddedness of the technology in black youth's lives and their willingness to move into new platforms more quickly than their counterparts” (Whack, 2017, para 3).

From Vine to Twitter to Tik Tok, Black youth are not only consuming media, they are creating it in ways that influence culture worldwide. While the cultural influence of Black teens' technology practices has gotten more widespread acknowledgement, they are not always compensated for their labor, especially on free public social network sites. Black youth's leadership with technology suggests that there is an opportunity for tech companies to partner with (and compensate) Black youth to develop interventions that would make a difference in how they and their non-Black peers research and prepare for college. Given the overwhelming whiteness of the tech industry, allowing Black youth to design the tools they need for postsecondary success is particularly important. As educators and policymakers promote the widespread dissemination of tech tools for college access, they should also encourage technology companies to see Black youth as co-creators in the development of these tools.

RECOMMENDATIONS FOR USING TECHNOLOGY TO INCREASE BLACK STUDENTS' ACCESS TO COLLEGE KNOWLEDGE

For Policymakers and Practitioners

As the pandemic and other cultural shifts bring about the increased integration of technology into educational settings, it is important for structural and policy changes to occur that expand access to computers and to the Internet. I consider two of those policy changes below.

For the digital divide to be truly closed, more work needs to be done to expand Internet access to communities where Black people live. The Federal Communications Commission (FCC) must ensure that the Internet is not only accessible, but it is affordable. A report by the Center for Public Integrity (2015) found that Americans have fewer choices of Internet Service Providers (ISPs), which leads to higher prices. Turner (2016) writes that people of color are more likely to live in areas where there are monopolies in Internet service, meaning that they are disproportionately impacted by higher Internet prices. The FCC could take many steps to lower cost, including increasing competition. Turner (2016) notes that increased competition in the mobile space has led to lower costs and increased access, even for low-income people of color. While there are policies that could support equitable and affordable Internet access, more work needs to be done to enforce them. Part of this enforcement includes increasing access in rural communities, who are often completely left out of Internet service, or experience unaffordable prices for service. Policymakers must work with telecommunications companies to make sure that individuals in smaller, rural markets aren't denied access to affordable Internet. Policymakers should also ensure that telecommunications companies are doing all that they can to serve customers in urban environments.

To increase Internet access to Black students, ISPs must also be encouraged to make continual fiber optic upgrades in all of the communities they serve, not just middle class and wealthy neighborhoods. Some technology companies have been accused of "digital redlining," the practice of intentionally neglecting to provide technology deployment or

infrastructure upgrades to certain areas based on income (Callahan 2018, 2019). This is an area where greater policy attention is needed.

Policymakers should also look at Internet Service Providers' practices that may be prohibitive to African Americans, including credit checks, which are historically biased. Turner writes "credit-check practices for wired-home internet is likely a key reason that low-income Hispanics and Blacks adopt it at lower rates than low-income Whites but do not lag in cellular/smartphone adoption" (p. 9, 2016). Some ISPs have also used other discriminatory practices including collecting deposits from customers and running unauthorized credit checks. Greater federal enforcement of such violations is needed.

Policymakers should also consider expanding the federal e-rate program to pay for residential broadband access. Educators have long encouraged the expansion of the e-rate program, which helps schools and libraries obtain broadband at discounted rates. A GAO report in July 2019 encouraged the FCC to assess making off-school premises eligible for the e-rate program. In March of 2020, a group of Democratic senators wrote the chairman of the FCC encouraging expenditures of e-rate to focus on distributing technology to students in homes. Citing the pre-pandemic homework gap, these lawmakers urged the FCC to take action to fund in-home connectivity efforts as a way to deter a deepening of the digital divide. This proposal has also drawn support from the Brookings institute, which has urged FCC and Congress to expand the scope of e-rate to include homes and other public spaces that students use for Internet access.

For K-12 Practitioners

As policymakers turn their attention to closing the digital divide, practitioners should continue their efforts to ensure that students receive high quality support in developing their digital literacy skills. From an assets-based approach, this would mean focusing not only on access gaps and the digital divide, but also on the unique skills and high engagement that Black youth bring to the technology space. Using digital literacy as a frame and leveraging digital engagement as a core interest of Black youth, educators should seek to combine these skills into interdisciplinary lessons about topics related to college preparation. Educators might think about how they can infuse topics related to college prep into other reading, writing, and math lessons. Educators can also help students articulate and design the high-tech and low-tech resources for college information that they would find helpful, and spread these ideas to others in the technology, policy, and education leadership communities. Allowing Black youth the opportunity to create tools that can meet their needs will help with the development of both basic and higher order thinking skills, and also promote college and career readiness.

This project also points to the need for educators to provide students with targeted information on how to use the Internet specifically to research and prepare for college. The many nuances outlined, including the difficulty of finding information, the challenges of differentiating between resources, and the difficulty of finding legitimate information about college reveal a need for digital literacy development that is specific to the college process.

Although this report focuses on technology, college access should not center solely around computer-mediated communication. As highlighted earlier in the report, underrepresented students may prefer to work with knowledge brokers to find personal and contextual information about postsecondary options. Educators should continue to consider the importance of low-tech, personalized support for students, including connections with Black mentors who have graduated from or are currently in college.

For Universities and for the Technology Industry

Educators' efforts to help students navigate technology should be met with technologists' and university marketing teams' efforts to simplify the information that students have access to. Information that is purposefully vague does a disservice to students who are from underrepresented backgrounds, as they may need information about how a specific school or resource will meet their unique needs. Technologists and university marketing teams also have a responsibility to make available information more culturally relevant. This includes creating resources (websites, social media, and mobile apps) that are intentionally designed with the needs and interests of Black students in mind. This might involve conducting more research on what those specific needs are, but it is necessary. Additionally, for the technology industry, including corporations, entrepreneurs, and venture capitalists, this involves collaborating with and compensating Black youth to develop websites, mobile apps, social networking sites, and other tools that meet their needs. A one-size fits all approach to college knowledge fails to meet the needs of Black students.

CONCLUSION

In this report I've outlined the experiences that Black youth have as they use technology to research and prepare for college. There is much nuance in this topic. The topic is complicated. For some students, barriers in access to computers and to the Internet will impede their ability to research and prepare for college. For other students, deficits in the technology itself, namely the homogeneity of college websites, the insular nature of social networks, and the lack of culturally relevant online content will make it difficult to use technology to build college knowledge. This report identifies the need for a renewed attention to developing digital literacy, both in a broad sense, and in a way that directly addresses the relationship between digital literacy and college knowledge. At the same time, this report takes an assets-based approach to exploring Black students' experiences learning technology. Such an approach considers Black students' roles as technology super users and innovators to suggest that while Black youth do have digital literacy skills, there is a misalignment between their skills, their access to technology, and the type of online college content that would be culturally relevant to Black students. The report speaks to the need for greater collaboration between students, educators, policymakers, and technology leaders to design and implement high tech and low-tech solutions for technology that center Black students' needs. With big vision and bold action, we can harness the power of technology to increase college access for Black students.

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