

Investigating Compounding Impacts of Racism & COVID-19 on Learning & Employment in Computing & Technology (CIRCLE-CT)

Findings From Survey 1 - Summer 2020



*A Collaborative Project of AnitaB.org, the National Center for Women & Information Technology,
and the STARS Computing Corps*

By Quincy Brown, Beth Quinn, Jamie Payton, Wendy DuBow, Yamelith Aguilar, Hayley Brown, and Shannon Cheng

INTRODUCTION

Since early 2020, the COVID-19 global pandemic has quickly and substantially altered the landscape of our personal and professional lives. As of January 14, 2021, over 92 million cases have been reported and almost 2 million individuals have died.¹ As the seriousness of the pandemic became apparent, governments issued stay-at-home orders in waves across the globe. Individuals who could, moved to work and study from home. Others continued to work in increasingly dangerous and uncertain workplaces or some found themselves without work or income. Particularly well-suited to remote work, many tech companies transitioned their workforce to working from home and have maintained this pattern. K-12 schools and institutions of higher education rapidly pivoted to online or hybrid models of learning but with great variation in methods. As the pandemic wears on, we are all grappling with the psychological and social impacts of social isolation and contracted lives.

We conceived of this year-long collaborative study in April 2020 to understand the impact of the COVID-19 pandemic on the computing community, including technologists who work in industry, those who work and study in the nation's colleges and universities, and those who teach computing in K-12 schools. Our focus was on how individuals and organizations were being impacted, and the potential implications for initiatives to broaden participation in computing (BPC). While our organizations' missions have always been about equity and inclusion in computing, we did not foresee how anti-racism and social justice would come to the societal forefront in summer 2020. While it is difficult, if not impossible, to disentangle the independent effects on BPC initiatives of these two forces, we knew that we could not study one without the other. Thus, in addition to asking about the COVID-19 pandemic, we included questions about the impacts of racial violence and the subsequent protests for racial justice to try to better understand the impacts of both on the computing community.

The current report includes analyses from the first of three data-collection events, a survey fielded between July 14 and August 1, 2020 that was designed to assess and document the immediate impacts of the pandemic and racial justice movements on educational and work experiences. This is not a comprehensive report; rather, it focuses on five key findings around organizational responses and their impact on individuals. We encourage readers to explore the data in more depth on the CIRCLE-CT Survey 1 Dashboard (bit.ly/Circle-CT).

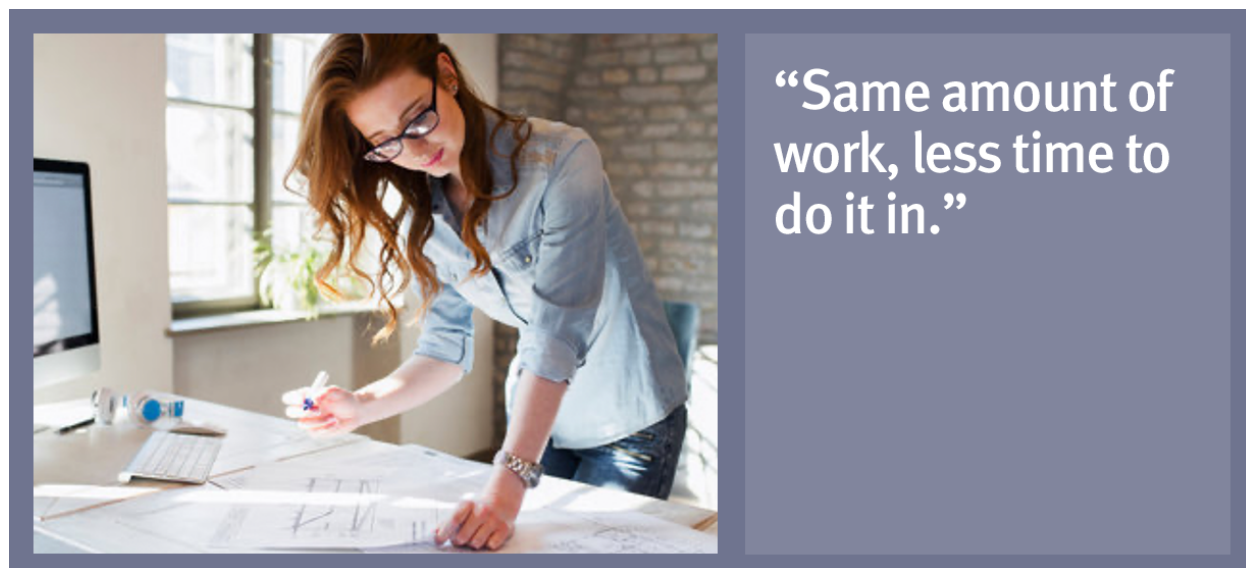
¹ COVID-19 Dashboard, Center for Systems Science and Engineering (CSSE), Johns Hopkins University, <https://coronavirus.jhu.edu/map.html>

KEY FINDING 1:

DIFFERENT SECTORS, DIFFERENT IMPACTS

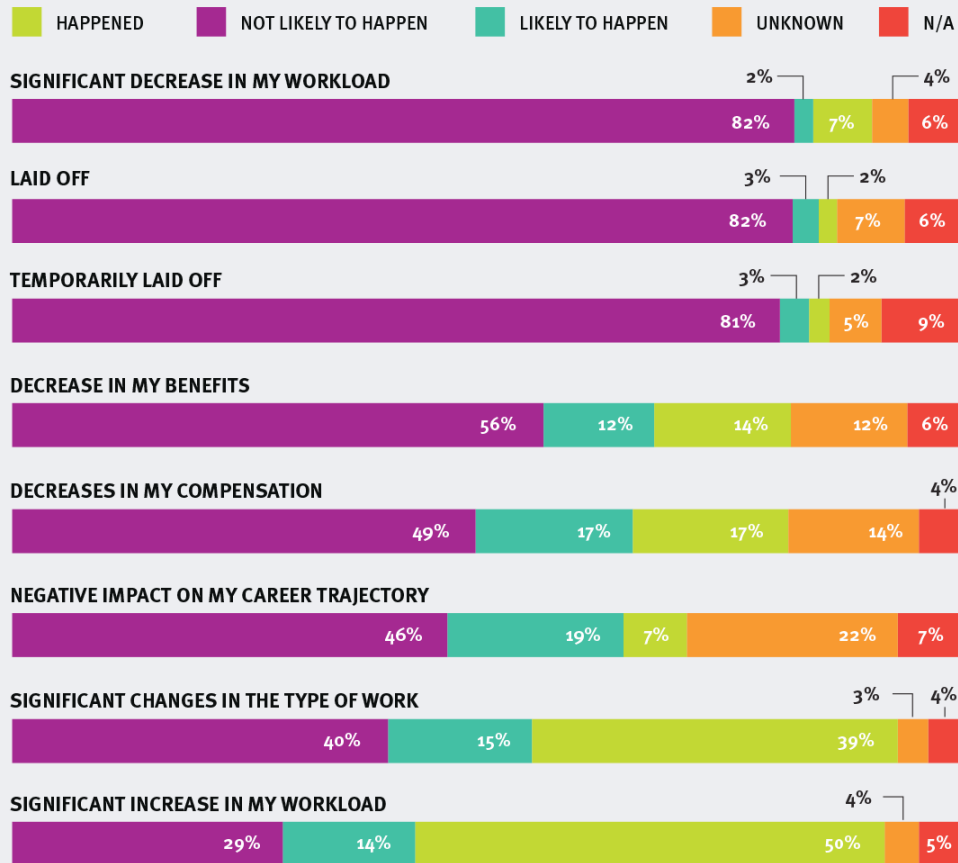
Across the world, COVID-19 has had a profound impact on how we work. We were interested in how the computing community, in particular, has been impacted and if there were differences across sectors (e.g., industry versus higher education).

Our respondents—working largely in computing and technology—have not been subject to layoffs we’ve seen in other industries. While respondents working in industry were more likely to report experiencing significant decreases to their workload (17% industry, 1% higher ed; $p < .001$) those working in higher education were more likely to report significant increases (54% vs. 37%; $p < .05$). This is likely due to faculty being tasked in the spring with rapidly moving in-person courses online. Those working in higher education also were more likely to report taking a hit financially, with 20% of respondents working in higher education reporting decreases in their compensation and benefits, while only a small percentage (13%) of industry respondents reported this impact ($p < .05$).



Few respondents reported immediate negative impacts on their career trajectory, but a substantial minority (19%) said that they expected the pandemic to have this effect in the future. For example, one respondent noted that their institution “has declined to adjust tenure expectations because of the pandemic.” For parents of school-aged children who are balancing child care and their children's remote learning alongside online teaching and a research agenda, the pandemic is likely to have many long-term negative impacts, and those are likely to fall more heavily on women.

HOW HAS YOUR ORGANIZATION'S RESPONSE TO COVID-19 IMPACTED YOU?



Of the respondents who mentioned other impacts, many noted mental and physical health impacts of the pandemic, including increased stress and *“miss[ing] in-person interaction with others.”* Others mentioned stress specific to remote work, such as having *“a huge amount of screen time”* and *“[having] an ever-growing number of communication modes I am required to monitor.”*

KEY FINDING 2:

DIFFERENT GROUPS, DIFFERENT IMPACTS

COVID-19

The effects of COVID-19 were felt by nearly everyone within the computing community. For example, a majority of respondents reported decreased productivity (66%) and decreased enthusiasm about work/school (56%) with no notable differences between groups. Concerns about childcare and finances were common: One respondent wrote that they wanted to have *“an answer for childcare issues caused by daycares and schools being closed other than ‘it’s the employee’s problem to figure out for themselves.’”* Another said they needed a *“stipend to pay for increased utility bills as a result of working from home or to pay for setting up a workspace at home.”*

Despite these types of commonalities, the impact was significantly different for individuals depending on their gender, being a racial/ethnic minority within the field of computing, and identifying as LGBTQIA, including the intersections of these identities. Consistently, when there were significant differences, the underrepresented and minoritized groups were having worse experiences.

There were also statistically significant differences based on whether respondents were a non-US resident, a caregiver, a person with a disability, or a first-generation college student. Given the small sample size for these groups, however, further research is warranted.

COVID 19: SIGNIFICANT DIFFERENCES BY INTERSECTIONAL IDENTITIES

Respondents were asked if experiences with the following increased or decreased due to COVID-19. The symbols indicate wherever significant differences between groups were detected.

| <p>*p<.05 ** p<.01 *** p<.001</p> | WOMEN & NON-BINARY | UNDERREPRESENTED IN TECHNOLOGY | BLNP+ | BLNP+ WOMEN & NON-BINARY | LGBTQIA |
|---|--------------------|--------------------------------|-------|--------------------------|---------|
| ABILITY TO CONCENTRATE | * | * | — | — | *** |
| ENERGY LEVELS AT WORK / SCHOOL | — | — | — | — | ** |
| DESIRE TO GO TO WORK / SCHOOL | * | * | — | — | ** |
| COMMITMENT TO ORGANIZATION / INSTITUTION | — | — | — | — | * |
| HOUSING INSECURITY | — | — | * | * | — |
| THOUGHTS ABOUT LEAVING THIS FIELD OF WORK / STUDY | — | — | * | — | * |
| WORK / SCHOOL INTERFERING WITH RESPONSIBILITIES AT HOME | * | * | ** | * | — |
| CONCERNS ABOUT LOSING OR GETTING JOB | * | * | ** | * | * |
| HOME LIFE INTERFERING WITH WORK / SCHOOL RESPONSIBILITIES | ** | *** | * | — | — |
| THOUGHTS ABOUT QUITTING JOB / PROGRAM | — | * | — | — | — |

Notes on Groups

T-test were run to determine differences based on the following groups:

- Gender: Women or Nonbinary compared to Men
- Underrepresented in Technology (URT): Black, Latinx, Native American, Pacific Islander, Middle Eastern or North African (BLNP) or Women or Nonbinary compared to White or Asian Men

- BLNP+ Women & Non-binary: BLNP+ Women and BLNP+ Non-binary compared to all men, White and Asian women, and White and Asian nonbinary
- LGBTQIA: Members of LGBTQ community compared to non-members of LGBTQIA community

View the CIRCLE-CT dashboard for details on how these groups' responses differed.

RACIAL JUSTICE

The racial justice movement echoing across the country since the spring also had differential impacts on groups within the computing community. While the results showed that many respondents reported that the recent attention to racism decreased their ability to concentrate, resulted in decreased energy and enthusiasm at work or school, and affected their desire to go to work or school, some groups reported this significantly more than others. In fact, those who have a marginalized identity within computing (and within US society)—women in general, people of color of all genders, and women from racial/ethnic groups historically excluded from computing—all reported more negative outcomes than their counterparts, as shown below. Although Black respondents, on average, report a slight increase in hope about racial justice being achieved, this value was significantly lower than that of respondents who did not identify as Black.

RACIAL JUSTICE: SIGNIFICANT DIFFERENCES BY INTERSECTIONAL IDENTITIES

Respondents were asked if experiences with the following increased or decreased due to the recent attention to racial justice. The symbols indicate wherever significant differences between groups were detected.

| <p>*p<.05 ** p<.01 *** p<.001</p> | WOMEN & NON-BINARY | UNDERREPRESENTED IN TECHNOLOGY | BLNP+ | BLNP+ WOMEN & NON-BINARY | LGBTQIA |
|--|-----------------------|-----------------------------------|-------|-----------------------------|---------|
| ABILITY TO CONCENTRATE | *** | ** | — | — | — |
| ENERGY LEVELS AT WORK / SCHOOL | ** | — | — | * | — |
| ENTHUSIASM ABOUT WORK / SCHOOL | * | — | — | * | — |
| DESIRE TO GO TO WORK / SCHOOL | *** | ** | — | * | * |
| COMMITMENT TO ORGANIZATION / INSTITUTION | — | — | — | — | ** |
| THOUGHTS ABOUT LEAVING THIS FIELD OF WORK / STUDY | — | — | — | — | ** |
| THOUGHTS ABOUT QUITTING JOB / PROGRAM | ** | *** | — | — | — |
| CONCERNS ABOUT LOSING OR GETTING JOB | — | — | ** | ** | — |
| HOPE ABOUT RACIAL JUSTICE BEING ACHIEVED | — | — | — | * | — |

View the CIRCLE-CT dashboard for details on how these groups' responses differed.

Organizational commitment and action related to racial justice, however, had many positive effects on individuals in those organizations. Publishing a pro-Black Lives Matter Movement statement was an important first step. When this was followed by other organizational actions showing commitment to diversity, equity and inclusion, including trying new anti-racism techniques, having a reporting system for bias, and working on recruitment, hiring and promotion practices, individuals felt more aware of racism, validated, hopeful, productive, had an increased desire to go to work or school, and felt stronger commitment to their organization or institution. All of these relationships were statistically significant (p<.05).

While it is clear that individuals from different backgrounds experienced the events and emotions of spring differently, it is also apparent that organizations can make a difference in individual commitment to school or work, and to the technology field in general. When organizations take a meaningful stand, students and employees notice and respond positively.

“The dean of our school has regularly provided links to DEI resources, talks, etc in his weekly emails. That has made me feel like this actually matters to him personally, which I appreciate.”

“Revised the mission statement to prohibit racism. The President gave speeches via video and email remarks in support of anti-racism, and in support of our values.”

“Effective: my institution donated \$ to local anti-racism organizations and rebuilding efforts, as well as scholarships for BIPOC students. Ineffective: shoving a lot of the hard work to an existing committee that has almost zero power to affect change on campus.

KEY FINDING 3:

ANTI-RACISM AND OTHER DEI WORK VISIBLE IN SUMMER 2020

Given the challenges that COVID-19 has presented to individuals and organizations, we wondered if diversity, equity, and inclusion (DEI) efforts might lose support. We hypothesized, however, that this might be counteracted by the highly visible anti-racism protests. While we can't disentangle the two, our respondents reported that DEI initiatives were either about the same as in January 2020 or had, in fact, improved. We had asked respondents to indicate whether their organization had implemented a number of initiatives, from sending out an anti-racism statement to committing to increasing representation of underrepresented groups in leadership positions.

Significantly more respondents reported that their organization had made public statements in support of anti-racism (78%) and instituted training and events (48%), with few reporting institutional and systemic changes such as hiring more DEI staff or increasing DEI budgets (17%), or recognizing and compensating employees for DEI work outside their everyday jobs (9%)

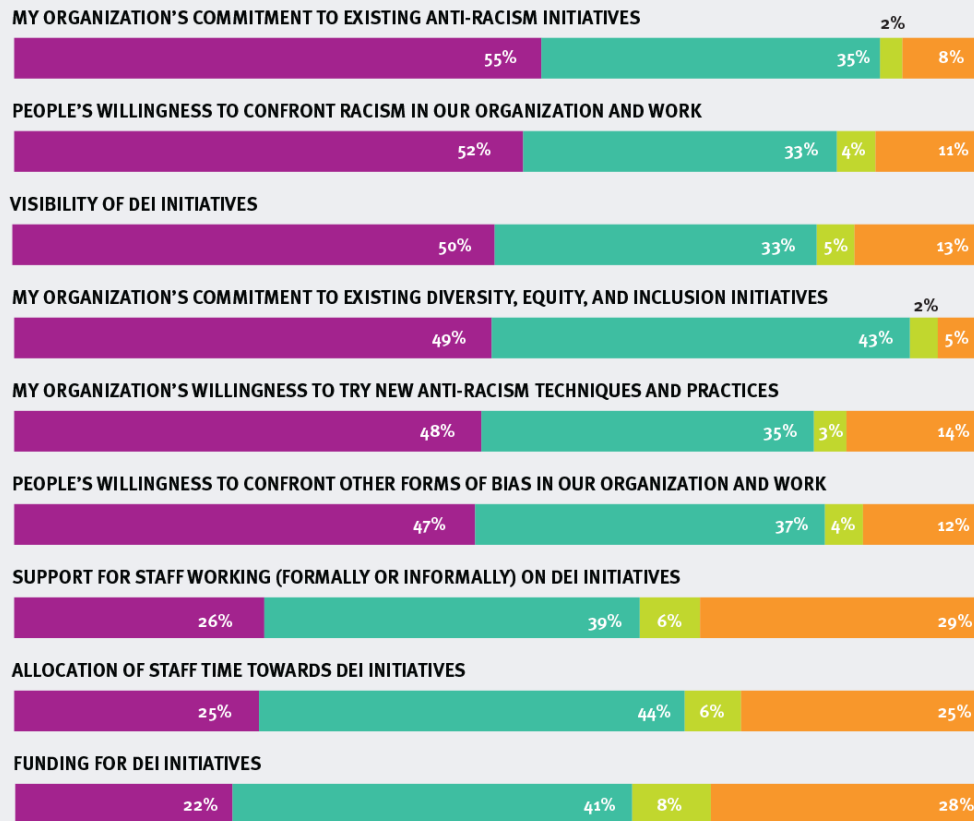
“Our hiring process has been biased for years and everyone knows it but leadership has been unwilling to take the necessary steps to truly fix it (rather than just tweak it). The good news is that an increasing number of employees at all levels are telling the company that if we do not commit to fixing this issue, everything else we do is for show.”

Few respondents felt that their organization's DEI initiatives had worsened since January of 2020. Note that their perception of January of 2020 and does not measure the overall efficacy or vigor of their organizations' efforts. For example, one respondent noted that their *“department already had a robust setup in place (dedicated hires, subcommittees, assessment, etc) around DE&I.”*

“With everyone being gone right now due to COVID, even most of our staff are furloughed for July, a lot of what we'd do during the school year isn't possible right now. It's unfortunate timing. But we have in the past had trainings related to bias, discrimination, racism, stereotype threat, etc, and they are ongoing every year.”

ARE THE FOLLOWING DIVERSITY, EQUITY, AND INCLUSION (DEI) COMMITMENTS AND INITIATIVES AT YOUR ORGANIZATION / INSTITUTION BETTER OR WORSE NOW, COMPARED TO WHERE THEY WERE IN JANUARY, 2020?

■ BETTER
 ■ SAME
 ■ WORSE
 ■ UNSURE



KEY FINDING 4:

COMMUNICATION MATTERS

Communication Around COVID-19 Responses

The survey asked about 11 specific organizational practices, from remote work options to financial support. Most respondents (86%) reported that *"transparent communication from leadership"* had occurred in their organization. (Remote work, not surprisingly, was the most common practice at 99%.) A majority of respondents (69%) indicated that transparent communication from leadership had a positive or very positive impact in helping them to cope with COVID-19. For example, one respondent commented that, *"Having a regular meeting with the President, Provost, and Department Chairs was a very helpful practice for communicating successes and concerns efficiently."*

We also asked respondents to write in examples of particularly effective actions their organization had taken in response to the COVID-19 pandemic. Clear, regular, and open communication—from leadership and within teams—was mentioned the most frequently.

One respondent wrote that the *"twice weekly staff stand-up meeting"* their department does *"help(s) keep everyone communicating and on the same page, and less isolated."* Another respondent noted that *"frequent, transparent communication...has reduced anxiety about decision making and decision making rationale, humanized our leadership, and bolstered our sense of working together as a team."*

As suspected, the COVID-19 pandemic has had differential effects across the computing community. In our sample, individuals from groups historically excluded from computing reported more positive impacts from transparent communications from leadership about COVID-19 than did those from majority groups ($p < 0.05$).

Communication Around Anti-racism Initiatives

As we have seen in the media, many organizations have made public stands against racism. More than three-quarters of our respondents (78%) said that their organization had *"sent out a statement of support for the Black Lives Matter movement and/or support of Black employees."* In addition, 40% of respondents reported that their organization had taken the next step and had *"outlined clear anti-racism goals and plans."* There were no notable differences between respondents in higher education or in industry, or between employees and students.

The impact of clearly outlining anti-racism goals and plans can be powerful. In our sample, when respondents reported that their organization had done this, they also tended to report:

- Greater "enthusiasm about work/school"
- Greater "desire to go to work/school"
- Greater "commitment to the organization/institution"
- Lower levels of "thoughts about quitting my job/program"
- Fewer thoughts about "leaving this field of work/study"
- More positive impacts on their work relationships



“We had at length discussions around this in all-hands meetings, slack and emails. There are many events, blog posts and sessions to help include the people of color and also make others aware of how they could help out.”

We also asked whether the respondent’s organization had *“committed to regularly asking employees for feedback about what the organization can do better with respect to DEI.”* Thirty percent reported that their organization had made this commitment, with many respondents (41%) reporting that their organization had not. Tellingly, a notable number of respondents (30%) were unsure if their organization had done this. When respondents reported this kind of two-way communication, they were more likely to report *“greater commitment”* to the organization and *“greater levels of hope about racial justice being achieved.”*



“Many of the statements and commitments have felt very performative and without a deep reckoning and responsibility taken for organizational harm. There has been little financial change to back up any of this talk.”

KEY FINDING 5:

FLEXIBLE, ADAPTIVE APPROACHES ARE HELPFUL

There is no question that COVID-19 required a rapid shift in instructional practices and student support services in higher education. We asked university faculty and students about the impact of the pivot to emergency remote instruction on their ability to teach/learn computing during the first three months of the pandemic.

Faculty and Staff

The most commonly reported organizational response by those working in higher education is that grading systems were adjusted (e.g., lenient deadlines, pass/fail option). A slight majority (59%) felt this had a positive impact for students, but some felt it had no impact (19%) or a negative one (13%). The second most commonly reported organizational response was to provide training and support for faculty to shift to remote instruction, with 65% of faculty reporting that receiving such training had a positive impact on their work. In an open response question, many faculty indicated that the shift to online teaching has resulted in a significant increase in workload. Perhaps not surprisingly, given the fiscal strain that many institutions of higher education are experiencing, the least common organizational response was providing tuition refunds.

Students

A majority of students reported that COVID-19 had a negative impact on their engagement in courses (68%) and their ability to learn (54%). In particular, we found differential impacts for student learning across demographic groups. Women from racial groups that are traditionally excluded in computing (i.e., Black, Latinx, Native American, Pacific Islander, and Middle Eastern and North African women) reported, on average, a greater negative impact on engagement in courses compared to women from majority groups. Interestingly, women from excluded groups reported a positive impact due to their ability to attend classes and changes in instructional practices, while White and Asian women reported an average negative impact on learning due to their ability to attend class and shifts in instruction.

Institutions

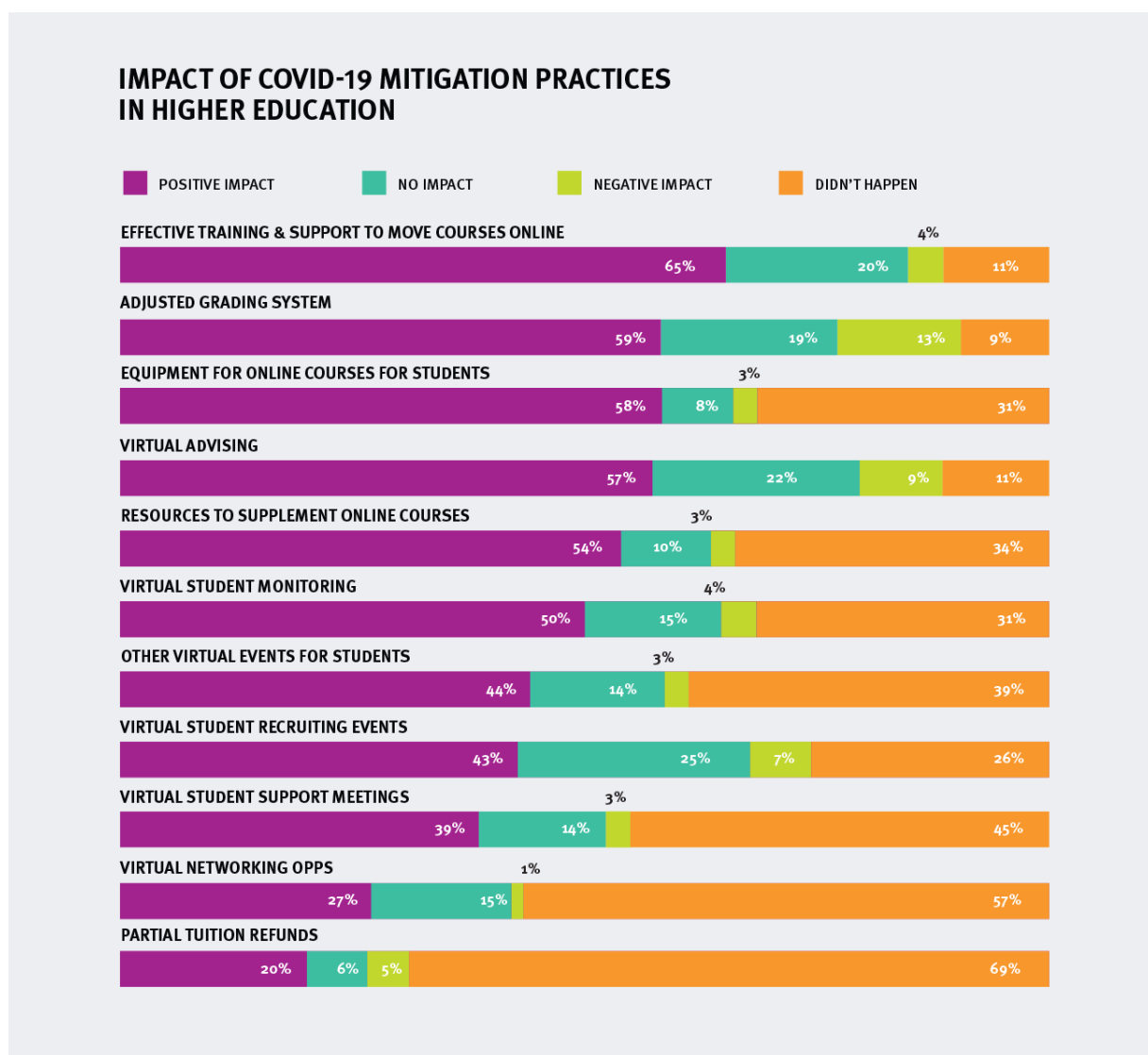
When an academic institution actively attended to COVID-19, we found that their students tended to report improved learning outcomes. In particular, our findings suggest that institutions should adapt to offer online services focused on student well-being and social support. For example, student respondents who were enrolled in computing at institutions that hosted virtual student support meetings (e.g., check-ins, mental health workshops, etc.) reported improved outcomes for ability to learn, higher engagement



“Being open and generous when it comes to accommodations for students is good. To add to this, I feel that the professors who say something along the lines of “Don’t be afraid to ask for extra time or help” eased the pressure off us a lot.”

in classes, and increased ability to complete projects compared to those individuals whose universities/schools did not, with similar findings when institutions adapted to provide virtual advising and events to students.

Beyond institutional responses, individual faculty can potentially have a significant impact on student outcomes simply by demonstrating empathy. Four out of 10 students reported that *“instructor concern”* positively impacted their learning. Classroom practices that embrace flexibility (e.g., relaxing attendance policies, extending assignment deadlines without penalty, and providing multiple ways to access course content) puts empathy into action. Such practices can potentially benefit all students and can address the disproportionately negative impacts of COVID-19 on the ability to learn that were experienced by LBGQTQA students and by women, particularly from groups that are traditionally excluded from computing (BLNP+ women), to receive academic support through peer tutoring. Additionally, exploring new ways to offer academic success services that build connections with other students, like peer mentoring and tutoring, can address isolation, build community, and advance student learning outcomes for students from all groups.



NEXT STEPS:

The project includes three additional data collection points which will be reported in subsequent publications:

- Fall survey (October 1 - November 2) explores in more depth potential impacts on career and education, and on diversity, inclusion, and equity initiatives, of the COVID-19 pandemic and the anti-racism movement.
- Spring survey (dates TBD) to understand the longer term impacts of the pandemic and racial justice movements on the computing community.
- Interviews with representatives from the computing community to explore in more depth the issues from previous surveys.

METHODOLOGY:

SURVEY INSTRUMENT AND ADMINISTRATION

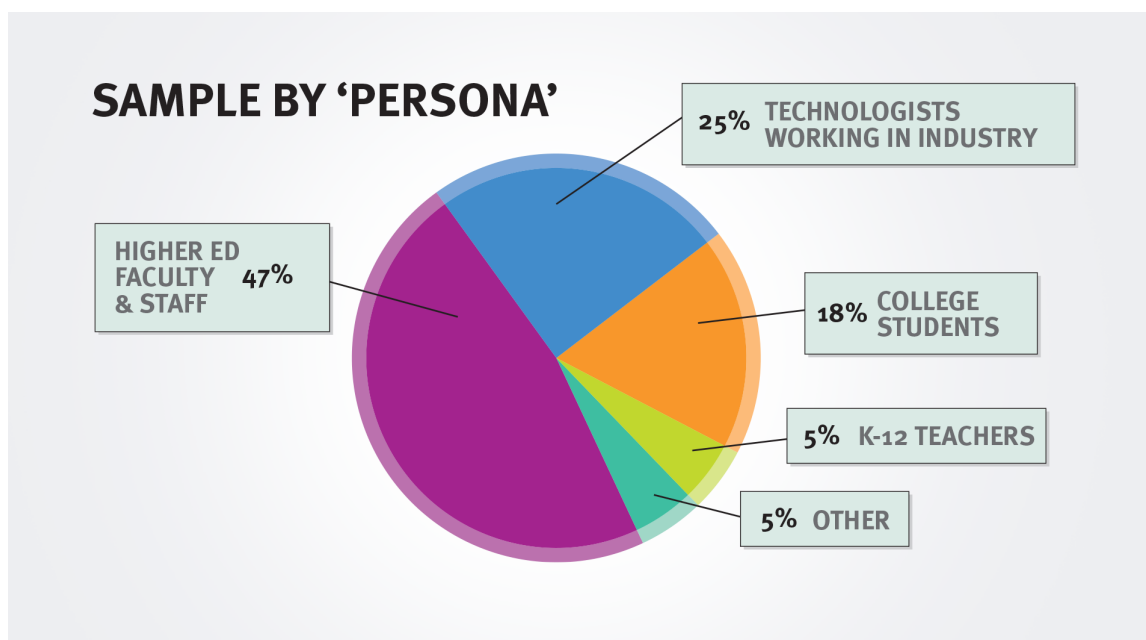
The 52-item survey included three sections: Participant Demographics, Impact of COVID-19, and Response to Increased Attention to Racial Justice. The full text of the survey may be obtained on the project dashboard. The survey included both forced choice and open-ended questions.

Respondents were recruited through multiple channels including direct email invitations to individuals on the mailing lists of the partner organizations (NCWIT, AnitaB, STARS), and more publicly via newsletters and social media. The emails explained that we were interested in *“gathering responses from individuals across the computing and technical ecosystem including K-12 teachers; post-secondary program leaders, educators and students; and individuals in the computing and technical workforce and tech startup communities.”* Potential respondents were encouraged to pass on the survey invitation to their networks.

The survey was administered online via Qualtrics and was open for responses from mid-July through early-August 2020.

THE SAMPLE

Four hundred eighty-six (486) individuals completed the survey. Almost half the sample were individuals working as faculty or staff in higher education. Of those, the most common (38%) position and rank was full or associate professor, with another 16% identifying as department heads or higher. About a quarter of the respondents were technologists working in industry. College students made up 8% of the sample and included both undergraduate and graduate students. Slightly more than half (57%) were undergraduates while 42% identified as doctoral students. Because the response rates for K12 teachers was so low, we did not do separate analyses for this group; they are, however, included in analyses conducted on the entire sample.



DEMOGRAPHICS

Gender

Respondents were asked to report their gender identity with the following response categories provided: Woman, Man, Nonbinary, Prefer not to answer, or Prefer to describe (open ended). Of the 297 who provided gender information, 185 (62%) identified as women and 95 (34%) as men, with nine individuals identifying as nonbinary. Within the sample of postsecondary faculty and staff, the distribution was slightly more reflective with 81 (56%) women, 57 (39%) men, and two individuals identifying as nonbinary. Individuals who responded “prefer not to answer” were excluded from all analyses using gender.

Race and Ethnicity

Respondents were asked to report their race and ethnic self-identities according to the following categories: Asian , Black/African-American, Hispanic/Latinx, Middle Eastern/North African (MENA), Native American/Alaska Native/First Nations, Pacific Islander/Native Hawaiian, White, Prefer not to answer, or Self-Identify (open ended). Multiple identities could be chosen.

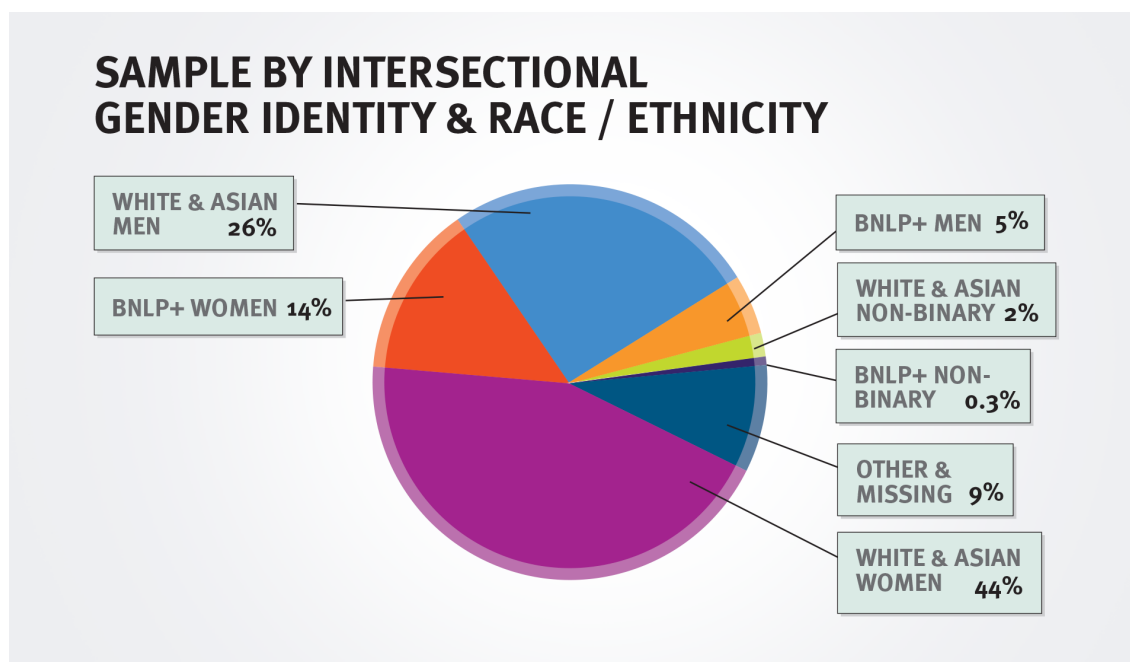
Individuals who identified as White comprised almost 55% of the sample, followed (in order of proportion) by those identifying as Asian (13%), Black or African American (9%), Hispanic or Latinx (5%); Middle Eastern, Native American, and Pacific Islanders made up less than 2% respectively.

Race and Gender

White women made up 36% of the overall sample, followed by White men at 19%. Asian women were 11% of the sample, with Asian men at 6%. The sample includes few respondents from other racial or ethnic groups.

LGBTQIA

Respondents were asked whether they consider themselves “a member of the Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, and/or Asexual (LGBTQIA+) community.” Responses were: Yes, No, or Prefer not to answer. Of the 280 individuals who responded to this question, 14% identified as LGBTQIA, 80% did not, and 5% chose “prefer not to answer,” while many others chose no response.



Sample Limitations

As a self-selected sample of individuals recruited primarily from the networks of the three sponsor organizations, this sample is not representative of the entire technology community. It is likely dominated by individuals who support broadening participation in technology initiatives, or whose organizations do. Women are also overrepresented in the sample compared to their current participation in computing.

ANALYSIS BY IDENTITY GROUP

Analyses were conducted by “persona” (K-12 computing teachers, staff, students, persons in industry) as well as by gender, LGBTQIA community status, racial-ethnic group, and underrepresentation in the technology field. In addition, we ran t-tests to compare the experiences of groupings of individuals based on identities, including:

| | GROUP 1 | GROUP 2 |
|--------------------------------------|---|--|
| GENDER | Women, Non-binary | Men |
| BLNP+ | Black, African American, Middle Eastern, North African, people of Hispanic and Latin origins, Native American, Alaskan Native, First Nations, Pacific Islander, and Native Hawaiian | White, Asian |
| BLNP+ WOMEN AND NON-BINARY | BLNP+ women, BLNP+ non-binary | Men, non-BLNP+ women, non-BLNP+ non-binary |
| UNDERREPRESENTED IN TECHNOLOGY (URT) | All women and non-binary, BLNP men | Non-BLNP men |
| LGBTQIA | Members of the LGBTQIA community | Non members of the LGBTQIA community |

ACKNOWLEDGEMENTS:

The authors would like to express appreciation for the input provided by the project's advisory committee:

- Timileyin Adebisi (Philander Smith College)
- Tracy Camp (Computing Research Association & Colorado School of Mines)
- Cheryl Calhoun (Santa Fe College)
- Veronica Diaz (Western Digital)
- Nicholas Lytle (NC State University)
- Richard Ladner (U of Washington & Access Computing)
- Manuel Perez-Quinones (U of North Carolina - Charlotte)
- Mandela Shumacher-Hodge Dixon (Founder Gym)

This material is based on work supported by the National Science Foundation under grant numbers 2031978 and 2031877. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Recommended citation: Brown, Q., Quinn, B., Payton, J., DuBow, W., Aguilar, Y., Brown, H., & Cheng, S. (2021). Investigating Compounding Impacts of Racism & COVID-19 on Learning & Employment in Computing & Technology (CIRCLE-CT), Findings From Survey 1 - Summer 2020. A joint report of AnitaB.org, the National Center for Women & Information Technology, and the STARS Computing Corps.