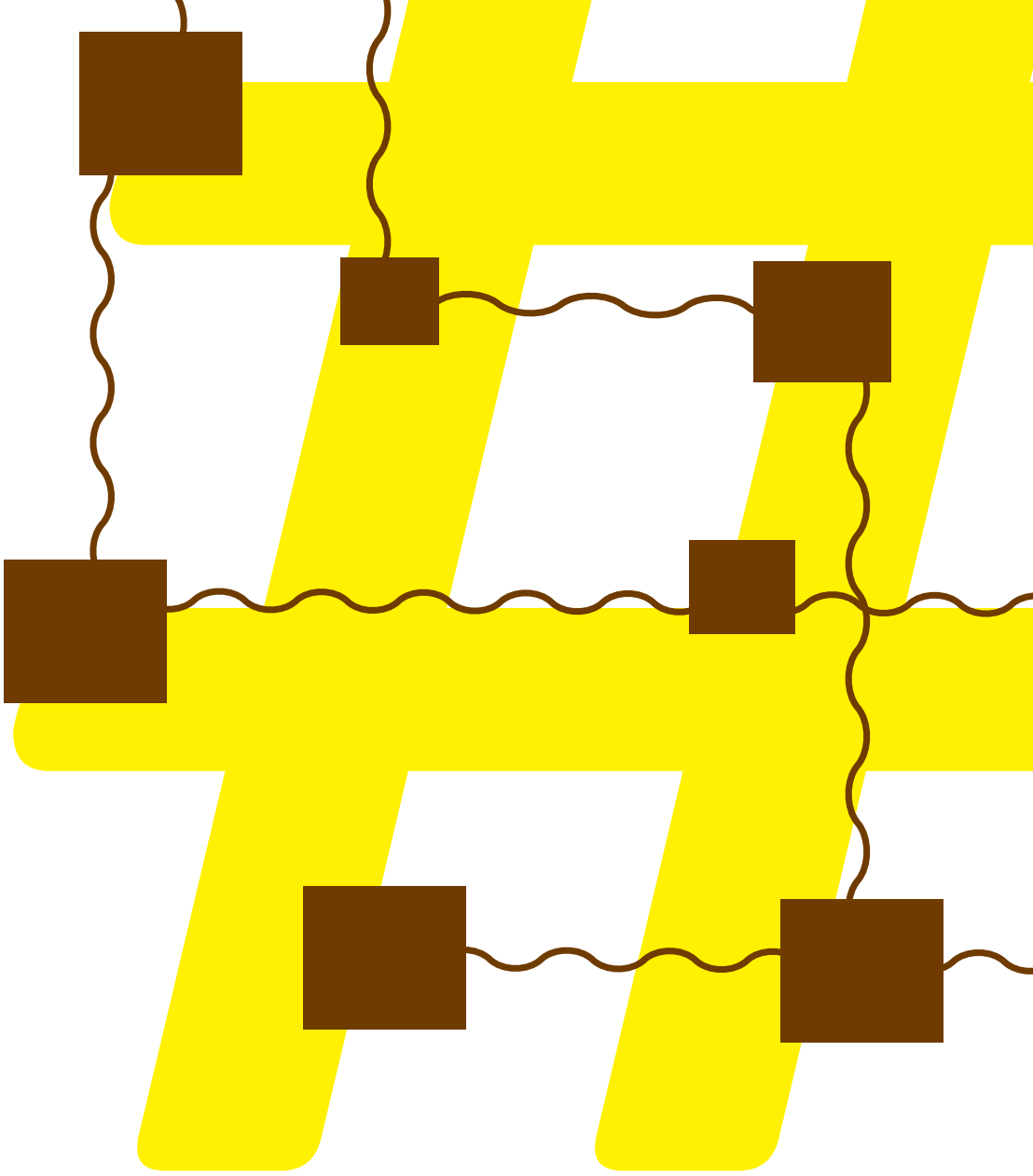

Black Tech Ecosystems

How Black Adult Learners Use Computer Code Bootcamps for Liberation

Antonio Byrd

BLACK TECH ECOSYSTEMS

HOW BLACK ADULT LEARNERS USE COMPUTER CODE BOOTCAMPS FOR LIBERATION

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BLACK TECH ECOSYSTEMS

HOW BLACK ADULT LEARNERS USE COMPUTER CODE BOOTCAMPS FOR LIBERATION

Introduction

In September 2017, Zeus enrolled in Clearwater Academy in hopes to be among the 20,000 people who would graduate from a computer code bootcamp that year. He bought into an uncertain Cold War-era promise (Guzdial, 2021) that computer scientists and private industry had resurrected in 2011 amidst a so-called software crisis: anyone who learns to code in less than a year at one of these intensive training programs can quickly get an entry-level job in software development. You don't have to spend four years in college and accrue enormous amounts of student loan debt. The son of a Cuban father and a mother of Spanish descent (I'll explain participants' racial identities and justification for inclusion later in this introduction), Zeus described himself as "mulatto—too light for the Blacks and too dark for the whites." He was five-foot-nine and weighed two hundred pounds. During the day, when he wasn't learning web development and employability skills at Clearwater Academy, Zeus taught children mixed martial arts at his mentor's dojo. At night, Zeus put his fighting skills to use as a bouncer at a Wild West-themed bar popular among white undergraduates. It was the only job where he could legally beat up white supremacy. But that bar wasn't a good match for his temperament: you fit in by being in college and keeping up with college students' fads. Recalling that fraught time going to Clearwater Academy, Zeus explained, "A big thing they did was like, someone comes up to you, and they have like an ice, and you're supposed to get down on one knee, and you're supposed to just kill it. And like, I didn't fit in with that, you know?" Icing is a drinking prank that began as an internet meme in 2010. Someone hides a bottle of Smirnoff Ice vodka in a place where one doesn't expect to find it and would be embarrassed if they got caught with it, like during work. The person who finds the ice must point the bottle in the air triumphantly, get down on one knee, and drink the entire bottle. If you don't, you lose your reputation as a "bro."

Zeus graduated from Clearwater Academy in December 2017. With web design added to his repertoire of literacy practices, Zeus could at least get away from the ice pranks, seek better job opportunities, and get a little social mobility. Instead, he threw together a hodgepodge of technological and physical labor to make ends meet: Zeus worked for a landscaping company while practicing graphic design for a local agency and volunteering for the Technology Education and Learning Support (TEALS) Program, Microsoft's high school computer science outreach project. Landscaping was a return to a life he once knew before Clearwater Academy, but the graphic design and computer science work took Zeus' literacy practices to another level. Under

the mentorship of an experienced graphic designer, Zeus learned how to create marketing materials like brochures, policy booklets, banners, tablecloths, and car wraps using Adobe's design suite software. His design work was terrible, Zeus admitted, but over time his mentor required fewer and fewer design drafts, a testament to his improving skills. The job wasn't front end web design, but it still built on his experience with art and drawing, something Zeus had been practicing since he was a kid. Meanwhile, mentoring high school kids in computer science exposed Zeus to the limits of his own computer programming knowledge. He taught in "nice fancy top buildings" which housed mostly white students. They worked with Scratch, a platform for teaching computer programming using visual blocks on a screen, and then later they learned the basics of Python. "But yeah, these kids were geniuses," Zeus thought. "They were smarter than me!" He felt like he was back in Clearwater Academy, struggling to keep up and get the coding into his head. Each day Zeus spent his time adapting to their needs, "showing them, trying to test these things out, see if they liked it, see what best fit them."

Zeus' true dream job was serving in the United States Army. Growing up, he loved the 1998 film *Glory*. Starring Morgan Freeman and Denzel Washington, the movie told the story of the 54th Massachusetts Infantry Regiment, one of the first all-Black Union military units that fought in the United States Civil War. The patriotism and heroics of Black Civil War soldiers inspired Zeus for years. But he thought his previous life selling drugs and getting in trouble with the law made him ineligible for military service until one day he ran into an old friend who was an Army recruiter. Zeus learned that if his crime wasn't a felony and seven years had passed, he could join the Army. He took the opportunity, and by September 2018, nine months after graduating from Clearwater Academy, Zeus was on his way to basic training in Georgia. After that, the Army assigned him to a base in El Paso, Texas, along the U.S.-Mexico border. He labored as an infantryman first and then moved to tanker. The armed tank battalion did regular drills where Zeus shot and loaded a lightweight machine gun called M240 Lima. Drills involved more than just shooting bullets; he had to pay attention to terrain, enemy movements, left-flank and right-flank tanks, and the infantry themselves, if they joined the drill.

Despite serving in the Army, the influence of coding continued. He felt the pressure of needing to learn as much as he could about computers, because Zeus couldn't anticipant when his Army service would end. He had to know about computers, to satisfy an insatiable hunger for learning about technology. It was imperative that he still spend a few minutes or hours reading about back-end programming, to practice coding exercises online using his phone and a little portable keyboard. He wasn't dreaming of a long illustrious career in the Army, after all; Zeus traded his body for "benefits, education,

computers." He enrolled in online classes with American Military University. Between orders from his superiors, Zeus would sit in his tank in 105 -135 degrees Fahrenheit reading about Network Plus, an exam for certification in information technology infrastructure.

His relationships with other soldiers would eventually take him out of the tank and into Army base offices. Zeus learned a lot about how human beings are just as connected along networks as computers. But more complicated. In the civilian world, biases, prejudices, and oppression against marginalized social identities take front row; however, in the military "the value, you know, of a person is really understood, … like, you know, the nation's defense comes first of everything … we're the first line of defense." In that system, racial identities flatten or become less a basis for judgement. During basic training in Georgia, Zeus' unit had to stand in freezing rain; Zeus started to get closer to his comrade to keep warm, but Zeus only irritated him. "And he was like, 'Man, get the fuck away from me. I'm not gay!'" Zeus recalled. "I was like, I looked at him like, 'You crazy? You crazy? You crazy? You crazy? You on the hard coals or something?'" Eventually he relented and stood closer to Zeus. Looking back, Zeus figured, "We could have been lovers. Like, we could have confused him. Like, for real, like, honestly, like, that's how cold it is. But like, yeah, you have to get rid of all mannerisms." What rises to the top is what you can trade with your comrades, the "valuable information and things that they find dear to them, you know?" So, Zeus could make friends with people from Lagos or witness a Chinese American make lo mien for Mexican friends who make churros for Black friends who teach white people how to play basketball.

Trading your value can also reveal the selfishness of comrades. As squad leader in the infantry, Zeus drove an eighteen-year-old junior soldier 45 minutes away from the El Paso base out past some mountains to meet a Latina. Zeus had a bad feeling about the idea, but the junior soldier offered money and his own vehicle. Not long after dropping him off, Zeus got a call from the junior soldier. "He called me and said, you know, like, 'Hey, bro, pick me up.' … Latinas live with their parents, you know, like in traditional family. So her parents came home and like, he was like, 'Pick me up, bro. They're gonna kill me,' you know, type stuff." Zeus was driving at night on unfamiliar roads, so he drove the speed limit as he turned back. At a green light, Zeus turned right but the driver behind him was over the speed limit and rear-ended Zeus. The car tailspinned and crashed. Zeus left the accident with a concussion and a banged-up body; in return, the junior soldier accused him of stealing the car. Zeus understood the point of the betrayal, because "People are out for their best interest when they're tired out there and that goes to show like a lot of people's lifelines is just their vehicle when they're on a base because you're

getting the heat. You can get called up for any reason. You want to have a reason to save yourself some time." The COVID-19 pandemic saved him from being discharged. The deadly respiratory virus disrupted all military objectives; everyone had to defend themselves from disease and support each other emotionally and mentally. Zeus proved his innocence while he recovered with regular speech pathologist appointments and pain killers.

The accident helped Zeus take another turn in his digital literacy practices since graduating from Clearwater Academy. The Army thought he didn't get along others, so they sent Zeus to work in base headquarters. All that time reading in hot stuffy tanks was finally going to pay off. Zeus worked on hardware like antennas and radios so tanks, administrators, and soldiers on the ground had consistent communication. Zeus also had close ties with high-ranking military officers. He drove the captain's jeep and communicated with him or communicated with others on his behalf through email, text messages, and phone calls. Less time in the heat and more time in the air conditioning of an office, Zeus hadn't landed the entry-level front end developer position Clearwater Academy had intended, but he did find information technology.

What does Zeus' story have to do with coding literacy? Using literacy for workforce development and a pathway toward social mobility has persisted for decades. President Lyndon B. Johnson, for example, made adult literacy education a national priority in 1966, the same year composition and rhetoric scholars set a new research agenda for learning what students do with writing. However, then, as now, the priority relies on skills gap rhetoric as a significant threat to the nation. This rhetoric suggests that a significant number of adults have a skills deficit, and they need resources to learn the basic mechanics of reading and writing (Bannon, 2016; Jacobson, 2016). Literacy opens doors to job training (there is no work without reading and writing). Computer programming is just the latest type of writing pulled into the rhetorical campaign politicians (Zinshteyn, 2016) and tech CEOs (CNBC Television, 2019) have used to get more people into computer science. Getting more people to labor in designing our digital environments, they argue, strengthens the economy, produces innovative technologies, and begins to diversify an industry dominated by white men. But Zeus barely did any computer programming on the job after finishing Clearwater Academy. Looking back on those short months at Clearwater Academy, Zeus admitted he wasn't good at coding anyway. In a 2023 follow-up interview, Zeus would describe the practice in this way: "[C]licking, you know, just trying things out that sounded like elementary, you know, and getting a bad, like no result for like hours, days at hand …"

Zeus had expressed what I call Black coding Discourse, his own language to describe coding literacy's relevance to his life and he to it. He developed this Discourse about coding literacy from his time creating, navigating, and then

reflecting on a vast ecosystem of experiences, materials, and people he had encountered. From doing coding literacy at Clearwater Academy and even through the TEALS program, Zeus learned that he could not learn coding well, and he could not get an entry-level job. Coding was like wading through a swamp, not getting anywhere productive, just sinking, and sinking. Instead, Zeus discovered new ways of thinking and being in the wider technological economy as a racially marginalized person. Learning coding at Clearwater Academy fueled his interest in working in information technology and that provided the gratification he always needed from literacy and work. Getting his hands on the hardware of digital technology suited him; Zeus could better imagine how people put concepts, ideas, and theories into the objects of computers for distribution along internet cables under the ocean and via satellites from space. The physical engineering of computers made more sense to him. Zeus meandered from circumstance to circumstance, no longer feeling the pressure of the economy to become more literate through the tech pipeline. By, in the words of Miles Morales, doing his own thing (Dos Santos et al., 2023), Zeus' journey to join the ranks of information technology specialists in the Army led to a more affirming sense of being and purpose. Zeus' story solidifies coding literacy as a complex, nuanced social and material activity that represents multiple "figured worlds" (Gee, 2011, pp. 69–72) and ways of being in a community. More important, he represents assets-based framing of so-called failure for Black and other racially marginalized people. In this book I take a closer look at what happens to Black people inside an already leaky tech pipeline and make visible the knowledge and processes Black adult learners bring to computer code bootcamps and develop further throughout the learning process.

The following question animates this study: To what extent do computer code bootcamps achieve their goal to raise low-income Black people's social mobility and diversify the tech profession? I address this question by reporting on a year-long ethnographic study of low-income Black adult learners learning web design at Clearwater Academy to address racial inequalities in their lives. This study took place throughout 2017 and then the year following into the summer with follow-up interviews. One follow-up interview with Zeus took place five years later in 2023. In this study, I find that despite claims to color-evasive education, coding literacy education for work is credentialed and distributed in a racial hierarchy that valorizes whiteness. Participants' accounts make visible how learning computer programming depends on and are shaped by racial and economic ideologies about literacy in ways not discussed in public discourse on the wonders of computer code bootcamps. While the promise that Black adult learners can use computer programming for upward social mobility ultimately does not deliver, I show that Black adult

learners create Black tech ecosystems and Black coding Discourse from their encounters with the practices, traditions, and beliefs of software development that center whiteness. In these ecosystems, often adaptative to each participants' individual circumstances, Black adult learners invest in each other's well-being and coding literacy learning. This mutual investment helps them develop a variety of knowledges, practices, and frameworks for navigating a computer code bootcamp and the software developer profession. From these interactions with coding literacy practices and its contexts, participants speak Black coding Discourse, which articulates their relationships with computer programming and its place in their literacy repertories. Black coding Discourse and Black tech ecosystems account for the material, social, cultural, and linguistic resources that should rise "above the fold" of conventional computer code bootcamp narratives and challenge definitions of success.

Black tech ecosystems and Black coding Discourse tie down overhype or mythical pronouncements that new emerging technologies will bring utopias by examining how they work in the lives of Black people and what they believe about those technologies. Journalist Laurie Penny observed that "the wants and needs of young, healthy, middle-class people with connections and a reasonable amount of spare cash" are overrepresented in Silicon Valley's user base; their problems can be solved easily, but "Structural social injustice and systemic racism are harder to tackle" (Penny, 2014). When technologies work for the people they were designed for, they seem amazing, useful, unproblematic. Pain points – short-term granular issues that impact users' experience with a product – takes priority for designers. However, they do not consider the long-term societal harms of their designs (Schmidt, 2022). In this case, the users who the designers were built for possess the political, cultural, and financial resources to protect themselves. We should look closely at the disadvantaged people who were elided during the technological design process, the ones without the means to protect themselves when technology goes awry.

This book makes contributions to three major areas: Black technoculture studies, adult education, and labor. Black tech ecosystems and Black coding Discourse describes the beliefs and practices of coding within Black technoculture. André Brock explains that "Technoculture is the set of relations between, and politics of, culture and technology" and Black technoculture specifically "incorporate[s] the materiality, temporality, and meaning-making capacities of the Black digital and its practitioners as a technological mediation of the Black 'post-present'" (Brock, 2020a, pp. 7–8). Black technoculture elides deficit thinking about Black digital practice and theorizes the joy of these practices. For Brock, Black cyberculture is an essential part of Black technoculture, focusing on the everyday, banal interactions of Black users such as on Black Twitter. Brock explains that research on technology

often stop at artifacts and practice but "cultural beliefs about technology are assumed to be universally held or limited to the use-case, often leaving the technologies bereft of critical scrutiny" (Brock, 2020a, p. 10). Cultural beliefs about technology reveals "how people visualize themselves (or others!) and their computer-mediated actions" (Brock, 2020a, p. 10). While I don't take up all the nuances of his matrix for Black technoculture (Brock, 2020b, pp. 227–228), I find that cultural belief and Black digital practice overlaps with understanding literacy as an ideological social practice. Investigating the linguistic and multimodal practices in mundane local contexts and even following them across physical and digital borders as materials, reveal beliefs, traditions, and values. Learning coding literacy for work may miss these beliefs and prioritize interests of institutional whiteness and patriarchy. This book explores how Black tech ecosystems and Black coding Discourse describe the digital cultural beliefs hidden underneath those priorities by closely attending to the circulation of language and action inside and outside a computer code bootcamp. As Black cyberculture investigates mundane interactions on digital platforms, this book approaches Black people's relationship with and use of computer programming as another aspect of Black technoculture.

My study also contributes to scholarship that investigates the lived realities and outcomes of community-based adult education. Jeffrey Grabill argues that schools, workplaces, and community literacy organizations overlap; they often work together in defining what literacy activities matter for people. He writes that "any attempt to understand literate practices without understanding the institutions that make certain practices possible and valuable fails to account for how and why literacy practices look the way they do" (Grabill, 2001, p. 7). "Communities and institutions," Grabill (2001) later writes, "are interrelated and constructed" (p. 87). In alignment with this thinking, other scholars—some of them outside literacy studies—theorize the link between a local community's digital literacy practice and the institutions that sponsor them (Brandt, 2001). From her study on low-income women developing their digital literacies in a nonprofit, Virginia Eubanks (2011) advocates for critical technological citizenship. She writes that learning technology for work benefits people but "it simply cannot produce the kind of critical consciousness we all need in order to imagine alternatives to the status quo" (Eubanks, 2011, p. 154). Critical technological citizenship critiques how technologies shape civic participation, especially from the perspective of those marginalized people most impacted by these technologies. There are few empirical studies on computer code bootcamps, but three notable projects come to mind: Ashley Rae's (2022) study on three computer code bootcamps and workshops for marginalized communities; Kate Miltner's (2019) qualitative work on a coding school that reinforces inequality through several gatekeeping methods;

and a small-scale interview with computer code bootcamp graduates by Kyle Thayer and Amy Ko (2017). Each reveal empirically the lives of coders during and after their time in computer code bootcamps. France Winddance Twine (2022) devotes a chapter to all-women computer code bootcamps. Her analysis on college-degree holding white women attempting to shift from non-tech careers into coding reveal that their pre-existing capital and digital literacies helped them easily shift into tech. Clive Thompson (2019) also shares a chapter on blue collar workers taking up computer code bootcamps in response to the local coal industry's decline.

The scholarship above address computer code bootcamps from technical and professional communication, communication studies, computer science, and journalism. A social view of coding literacy and race adds to this impressive body of work by highlighting Black people's experiences in a regional labor market. Labor and race in Silicon Valley have been extensively explored (Zlolniski, 2006; Pellow & Sun-Hee Park, 2002; Gray, 2019; Meehan, 2021; Park, 1999), but, as I write in Chapter 4, the hiring and workplace literacy practices of Silicon Valley companies resonate with smaller tech companies across the country and globe (Takhteyev, 2012). This book highlights the need to trace these influences in less known markets for a more realistic view of coding literacy, labor, and race for Black people with computer code bootcamps as their only adult education. In addition, I apply Grabill's argument that to change meaning and value of literacy, we must change how different institutions relate to one another. Black participant's discourse about the value of computer programming in their lives and the subsequent ecosystems that it creates suggest possibilities for how computer code bootcamps and the workplace interact. One possibility is that they mutually prioritize Black lived experiences and Black technical knowledge in curricula and workplace practices.

Black Tech Ecosystems reveals how social mobility as a disparate outcome of learning coding literacy results from a complicated relationship among literacy, labor, and race. Clearwater Academy distinguishes itself from other educational institutions for computer programming like K-12 schools, universities and colleges, and extracurricular programs: they are a worksite, so their adult learners work fulltime (35 – 40 hours a week) except without benefits and without pay. Black adult learners in Clearwater Academy do not learn computer programming as conventionally understood in educational settings; they learn *how to labor with computer programming* according to multiple social and cultural dimensions in the tech industry. They labor for Clearwater Academy and the tech sponsors hoping to extract their talent. From a critical race perspective, I suggest that narrowing coding literacy to adult education for work maps the raciolinguistic belief that certain practices with reading

and writing produces good workers onto computer programming. Coding literacy gets subscribed into a white supremacy agenda, making it prestigious or unique in digital literacies for some racial identities but not others. Under those conditions, Black participants rethink their digital literacy and coding literacy as tools and practices for redefining what labor looks like for themselves. I contend in this book that Black participants find liberation from barriers to laboring with computer programming and the typical narratives of what counts as Black labor in the tech industry. This calculated look at the unique circumstances of low-income Black adult learners attending a computer code bootcamp shows how computer programming, as an emerging literacy, might facilitate a more dispersed set of opportunities that is deeply connected to the specific needs of Black people rather than the economic and diversity needs of tech in the United States. While policymakers wring their hands over how to get Black people into working for tech, this book considers how Black adult learners labor in a computer code bootcamp and reconceptualize labor after they graduate. Across four chapters I show how Black coding Discourse and Black tech ecosystems lead to these significant revelations for Black adult learners.

New Literacies; Same Old Story

To appreciate the theories advanced in this book, I describe the significance of computer code bootcamps to histories of Black labor and literacy in the United States. First, I establish computer code bootcamps as a logical response to changing economic needs; theories on literacy as an economic resource and coding literacy as a type of writing solidifies why computer programming draws my interest as a literacy studies scholar. Without their knowledge, advocates for coding literacy—such as Code.org—rely on familiar workforce development rhetoric to make their literacy campaign a national effort that is everyone's responsibility—teachers, parents, politicians, venture capitalists, and tech companies. The coding movement also suggests that *everyone* really can learn to code, so it targets both children and adults as potential workers. I later describe theoretical concepts from literacy studies, history, education, and sociology to help me highlight the continuous struggle Black communities have with the narrative that more literacy, or more education, will close wealth gaps while bringing diversity to technological designs. This book builds on, takes inspiration from, and ultimately diverges away from this knowledge to understand the role coding literacy plays in racial capitalism (the idea that capitalism thrives off the labor of racially marginalized people) and the knowledge economy and what downstream impact they have on Black lives.

Kids, Coding Makes You Powerful ... And Marketable

The modern coding movement began in 2009 when the United States federal government declared the second week of December Computer Science Education Week. Microsoft also called for a national plan for computer science education; the company's software engineer Kevin Wang founded the Technology Education and Learning Support (TEALS) program in the same year. These are kernels of the beginning, however. The movement accelerated after Hadi Partovi and Ali Partovi, twin brother venture capitalists who had been early investors in Facebook and Airbnb (Hadi) and Zappos and Dropbox (Ali), founded Code.org in 2012. They offered a new literacy campaign that built on the National Science Foundation, Congress, and Microsoft's goals and outcomes. They agreed that everyone can and should learn to code, and getting computer science curricula in more public schools can make that happen. The website offers a library of free tools and resources for kids to learn computer programming but in 2012 Code.org was also a platform for this iteration of the movement. The nonprofit leveraged the power of social media and celebrity. In 2013, Code.org released "What Most Schools Don't Teach" which features stories of known and less-known influencers in the tech industry on how they got into coding: Mark Zuckerberg, Bill Gates, Jack Dorsey, and other founders of popular digital platforms. The video next switches to commentary by music celebrity will.i.am and professional basketball player Chris Bosh on how computer programming is a necessary skill in the 21st century. Although the impetus for Code.org is to get kids coding (Singer, 2017), as declared in the opening minutes of the video, the narrative shifts as the video reaches the conclusion: working for Big Tech companies, replete with images of open concept offices, pool tables, and food from the best executive chefs around, is the goal (Code.org, 2013). Coding is fun but, when you work for software companies, you can make money while having fun.

That viral video, and Code.org, would have significant impact on the state of computer science education in public schools. In 2022, Code.org reported that fifty-three percent of U.S. public schools offer foundational courses in computer science, and thirty-seven states had adopted at least five policy recommendations that were jointly created by The Code.org Advocacy Coalition, Computer Science Teachers Association, and the Expanding Computing Education Pathways Alliance. But what powers those guidelines may be the tech industry itself: As of 2023, Code.org lists Microsoft and Amazon as Platinum Supporters (each donating $3,000,000 or more) and Coinbase and Google as Gold Supporters (donating between $1,000,000 and $2,999,999). Google would follow Microsoft and create their own computer science curricula for public schools, and Apple delivers a curriculum for public schools

in Swift, the computer programming language that powers the company's iOS operating system. Apple does not donate to Code.org. Other non-profit organizations provide extracurricular programs for youth, especially Black youth, such as #YesWeCode (now called Dream Corps TECH). These programs extend their reach and longevity with tech company partnerships such as the collaboration between Kimberly Bryant's Black Girls Code and Google. Some speculate, and rightly so, that these companies aren't just investing in computer science education for children out of kindness, but rather they seek to be literacy sponsors (Brandt, 2001) of future workers.

The viral video's shift to sleek offices, sumptuous food, and recreational rooms makes a stronger appeal for coding labor and reflects the reality of the economy's so-called dire need for software developers. Digital technologies are so essential in our everyday lives that the U.S. Bureau of Labor Statistics predicts that software developer employment will grow 22 percent between 2020 and 2029, more than any other occupation's average. At the same time the workforce remains majority white and male. The top five tech companies in the world—Meta, Amazon, Apple, Netflix, and Google—have been criticized for this lack of diverse workforce. Despite their efforts to recruit and retain more Black coders since 2014, little progress seems to have been made across all these companies. Partnering with the NAACP, the Kapor Center reports that between 2014 and 2021, Black representation in the tech workforce increased just one percent with 3.7 percent of technical roles held by Black people (The Kapor Center & NAACP, 2022). Of course, coding for empowerment alone doesn't put food on the table; the one percent owns these companies. They may not *intentionally* seek workers, but these programs nevertheless create pipelines to meet demand. Getting workers out of public schools would take years, and even then, not enough racially marginalized people will continue down the so-called tech pipeline.

However, extracurricular coding programs are factories for extracting ideas from youth without compensating them for their labor. For example, across the United States K-12 students participate in weekend-long competitions coding mobile apps and websites. Winners in these hackathons may get prize money or free software. Corporate sponsors appear at these events giving the ethos that the sudents' skills and ideas matters in the knowledge economy and supplying them with social and emotional capital. If a team does well enough, they could pitch their idea to investors at the hackathon. But there's an air of advertising at these hackathons: young coders use corporate sponsors' technologies to create their apps, and these competitors could market these companies to their peers. Under a "fictional expectation" that these coders will one day make it big, tech sponsors get to "outsource work and crowdsource innovation" (Zukin & Papadantonakis, 2017, p. 177) for cheap,

even if most ideas don't become reality. Popular media also perpetuates coding literacy as child labor. Black Girls Code and Girls Who Code position girl coders as learning computer programming for fun while raising up a generation that will one day correct the ongoing whiteness and cisgender patriarchy of computer science and the tech industry. However, Nickelodeon's television show *Game Shakers* (2015 – 2019) presents white girl coders as talented workers prepared to make money as children in the present, *not as future working adults*. A caveat here, however, is that *Game Shakers'* main characters, Babe and Kenzie, find success partly through the "childish" behavior of their business partner Double G, a Black adult creative director. His behavior contrasts from the more serious and creative attitudes of the show's white teens, suggesting that "the creative white coding girl as the ideal creative subject and erases the possibility of the Black coding girl" (Knotts, 2022, p. 127). In both real and imagined media, coding for youth means coding for work and labor exploitation.

Computer Code Bootcamps: We Will Get You to Work

The coding movement also reaches out to adults who never had the opportunity to learn computer science in childhood but may have interest in joining the ranks of software developers and other tech-related jobs. Computer code bootcamps provide an alternative pipeline to diversifying tech at a faster rate than traditional learning and labor recruitment through universities; these programs teach adults computer programming within a year at a relatively low cost. While in 2012 the industry often offered training in front-end design and backend programming, computer code bootcamps have adapted to the labor market by providing other in-demand skills such as in cybersecurity, machine learning, algorithms, cloud computing, and game development. Computer programming remains the most in-demand with 46 percent of bootcamps covering the industry (Juberg et al., 2023). Required social distancing in response to the COVID-19 pandemic increased online course offerings and they have not slowed down since 2023. Whatever programming language or software learned for whatever purpose, what awaits graduates are lucrative entry-level jobs.

There are several resources that track the computer code bootcamp industry, all of which use different methodologies. I cite two well-known sources—Course Report and Credit Karma—to show that regardless of the method, they seem to consistently point in the same direction: computer code bootcamps, and bootcamps that train adults in other tech skills, continue to be popular. In 2013, just thirty computer code bootcamps existed, and despite a spate of significant closings such as Dev Bootcamp and some questioning the

worth of other computer code bootcamps, Course Report lists 500 bootcamps in the United States and Canada in its 2020 report. In 2019, computer code bootcamps graduated over 23,000 adult learners with eighty-three percent of surveyed alumni finding work in tech. The average worker, according to Course Report, is a thirty-one-year-old bachelor's degree graduate with seven years of work experience in their back pocket and no computer programming experience. Six percent of graduates are Black or African American, just one percent less than the percentage of Black coders in the U.S. tech industry (Eggleston, 2021). In 2023, Credit Karma's data gathered from LinkedIn showed that 115,673 people graduated from computer code bootcamps between 2021 and 2022. To understand the significance of graduate numbers, Credit Karma reports on years from 2012 – 2022, showing that nearly 300,000 people report on LinkedIn alone being a graduate of a computer code bootcamp. The revenues continue to grow for computer code bootcamps: In 2018, the industry generated $240 million dollars in profit. By 2022, computer code bootcamps took in nearly $730 million, suggesting that in the next few years computer code bootcamps could be on track to become a billion-dollar industry (Juberg et al., 2023).The model can pull in people looking to switch careers quickly, from non-tech work to work in tech; they extend the so-called meritocracy of software development, and argue for financial uplift for marginalized people. If marginalized people fail to add representation to tech, that's on them and not the industry's "obstacles or gaps on the path between gaining skills and getting a job" (Abbate, 2018, p. S150).

Think of computer code bootcamps as what sociologist Chris Benner (2002) calls labor market intermediaries (LMIs): organizations that match employers with workers who have the skills and competencies they need. There are three types of LMIs: private sector LMIs operate as temporary work agencies or online labor platforms (Corbel et al., 2022), connecting literate workers and the employers looking for contractors; membership-based LMIs advocate for unions; and public sector LMIs offer trainings and certifications, like stand-alone computer code bootcamps or colleges and universities that adopt the computer code bootcamp model into their adult education programs (Dudley & Rindlisbacher, 2021). LMIs had been helping workers find long-term jobs for decades until after the 1970s when the economy changed dramatically and strengthened the need for public sector LMIs. Supply chains, trade, investment, and capital flows became integrated around the world. Information technologies allowed simultaneous work, which flattened hierarchies and removed the need for middle management. Industries created new products and faster production processes to remain competitive in the global economy. These three changes in the economy since the 1990s, Benner argues, has changed the nature of labor. Silicon Valley relies on different "forms

of flexible labor—networking, mobility, and nonstandard employment" to remain competitive among peers (Benner, 2002, p. 38). For example, firms need workers who can complete several tasks and change their skillset quickly according to the firm's needs (flexible work). These work tasks occur under short-term or nonstandard contracts (flexible employment) (Benner, 2002). What is known as the gig economy now, mediated by platform literacies and gig literacies (Corbel et al., 2022), has its roots in the rise of information technology systems in a global economy. This model for work in tech recalls critiques of human capital: it treats workers not as human beings but as mere task-completers for the engines that run digital ecosystems. I describe later that racism exacerbates this perspective of Black workers.

Because Silicon Valley demands speed and efficiency, gathering information on what skills a firm needs from workers can be costly and time consuming for both employers and workers. LMIs like computer code bootcamps bridge the two and help them reduce the cost of transaction and time for finding work and workers. Computer code bootcamps are canaries in the coal mine: they plug into the shifting needs of the tech industry (Bennett & Steinberg, 2022) and then communicate those needs with training or certification for unemployed people or people looking for new work. At the same time, employers and employees can use computer code bootcamps to access power to find jobs and negotiate the terms of their contracts. Public sector LMIs play a crucial role in producing "good literacy practices" so adults can become "good workers" in a changing and uncertain economy. Although the results can be mixed, LMIs in the public sector have immense value to regional labor markets (Pennell, 2007) and can help racially marginalized people find some pathways into the Fourth Industrial Revolution (Farrell et al., 2021). However, computer code bootcamps can still worsen inequality in the tech industry. Workforce development for diversity and equity often suggests to the public that the goal is to hire "permanent" employees. When data on diversity in the tech workforce considers temporary or contract work, the reverse happens: tech companies contract out more work to Black Indigenous People of Color (BIPOC) than white workers. BIPOC contract workers are the hidden labor often not accounted for in discourse on the lack of diversity in the tech industry. What continues, and what I'll delineate further in the next section, is an "occupational segregation" that undermines the argument that coding literacy offers opportunities of social mobility for marginalized people (Tech Equity Collaborative & Project Include, 2021).

The computer code bootcamp industry also traffics in what sociologist Tressie McMillan Cottom calls Lower Ed—for-profit educational institutions offering short-term credentials that thrive off socioeconomic inequality. "All of higher education benefits from inequality in some way," writes Cottom,

"but only for-profit colleges exclusively, by definition, rely on persistent inequalities as a business model" (Cottom, 2017, p. 21). Similar to public sector LMIs, the rise in short-term credentials from for-profit institutions comes as a response to "structural changes in how we work, unequal group access to favorable higher education schemes, and the risk shift of job training, from states and companies to individuals and families, exclusively for profit" (Cottom, 2017, p. 11). Lower Ed institutions exist because marginalized communities cannot access higher education; Lower Ed absorbs the "breadcrumbs" that fall from the table. For-profit institutions offer themselves as a safe alternative by exploiting the narrative that a good education leads to social mobility, and they target the most marginalized of people. Cottom explains how for-profits make a profit: Once adult learners register for classes and stay in those classes for the first few weeks, the institution claims their federal or private student loans. Black adult learners enrolling in a for-profit college may already be saddled with debt or other forms of economic inequality; other Black adult learners may max out their student loans before graduating. Even those who do finish with a for-profit degree, may find jobs that do not pay enough, keeping them in debt for years. Cottom writes that Lower Ed does not "[challenge] [our faith in education'] market imperatives" and they maintain "the status quo of race, class, and gender inequalities in education and work" (Cottom, 2017, p. 12).

Cottom has already clocked computer code bootcamps as coming from the same era as for-profit colleges, targeting well-off adults who have the means to take on debt in exchange for coding literacy (Logic Magazine, 2017). Poor racially marginalized people making a similar investment in computer code bootcamps will already run through the familiar cycle of economic inequality as experienced in for-profit colleges and universities. Financial models to reduce the costly consequences of private student loans do exist for low-income racially marginalized people, such as the GI Bill, employer sponsorship, scholarships, living stipends, the Workforce Innovation and Opportunity Act, installment plans, deferred payment tuitions, and income shared agreements (ISA). However, fewer bootcamps offer ISAs these days. ISAs are contract agreements that adult learners will pay a percentage of their future income to computer code bootcamps. The deferred payment plans ask computer code bootcamp graduates to pay back tuition in monthly installments over time; and graduates know what that monthly bill will be upfront. ISAs, however, hide what the monthly bill will be. In 2021, the Consumer Financial Protection Bureau (CFPB) found computer code bootcamps mispresent ISAs as a debt-free options when in fact they are student loans (*CFPB Takes Action Against Adult learner Lender for Misleading Borrowers about Income Share Agreements*, 2021). In 2022 a bipartisan group of senators—Mark Warner,

Todd Young, Marco Rubio, and Chris Coons—introduced the ISA Adult Learner Protection Act. The bill was referred to the Committee of Finance but had not been taken up for consideration again until as recently as 2023 when these senators reintroduced the bill.

Given their position in a job market that puts the responsibility of retraining on individuals, computer code bootcamps are another option for literate people to accumulate new literacies according to felt pressures of the macro-economy (Brandt, 2001). If computer programming really is the next necessary skill, coding literacy continues a long history of evolving literacy practices. Reading remained the dominant necessity for economic activity throughout the 20th century until the late 1990s when mass production gave way to a knowledge economy; driving data and information require workers to spend more time writing than reading (Brandt, 2014). Although the current coding movement is a decade old, the question of whether all workers should learn coding is still an "it-depends" answer: It depends on what you want to do with computer programming. What's the purpose and goal? To what ends? Some computer programming languages were designed for specific functions over others (languages made for front-end design may not map well into backend programming where data structure management happens). It remains unclear to what extent computer programming really matters for multiple occupations in the general workforce; coding still doesn't have the same reach as writing in print or even multimodal composing and revision on the job (Lauer & Brumberger, 2019). Occupations other than software development do not and will not adopt coding literacy despite discourse on its power and usefulness. They need logical integration into their everyday workplace practice. For example, journalists had begun using coding in their work during the 1960s when journalist Philip Meyer famously collaborated with computer scientists to analyze conviction rates in Philadelphia. Meyer (2002) would later advocate that journalists use computer assisted technology to help them analyze publicly available data for compelling storytelling. Computer programming advances these technologies from the 1970s and 1980s by integrating sophisticated data visualizations into reporting. Data journalism has become an important context for understanding coding as an intermediatory tool for structuring data. Coding isn't just a technology but also a situational and relational way of writing with other symbol systems (Lindgren, 2021).

Diane E. Bailey and Paul M. Leonardi's (2015) research on occupational technology choices demonstrate that there are no easy answers for why an occupation adopts a technology. The notion that as technologies advance, more jobs integrate them without question could not be more complicated. Bailey and Leonardi explain that it's not just about finding the right tool for the right

job or adopting new technologies because of the social setting. From their extensive observations of three product engineers, Baily and Leonardi find that people with similar responsibilities use different technologies because of occupational factors: the market they work in and their knowledge. Baily and Leonardi write, "In other words, these occupational factors, whose roots are largely historical, social, and economic, not technological, nonetheless shape the role of new technologies in each occupations' work" (2015, p. 11). Occupational factors lead data journalism to adopt some computer programming languages over others (such as the usefulness of JavaScript for Ray in Lindgren's study), but other occupations may not have the factors that require coding literacy to get work done. Coding literacy's clearest pathway toward social mobility is software development, not necessarily other occupations that integrate computer programming. In this occupation, success isn't just knowing the practices of computer programming, but also navigating and performing the discourses and behaviors—the sociocultural expectations—of tech.

This study looks over the shoulders of for-profit computer code bootcamps and focuses on the nonprofit computer code bootcamps standing behind them. Clearwater Academy operates in the poverty-busting business for racially marginalized people, which is a heavy burden as the United States federal government has created financial policies like tax credits that subsidizes wealth at the expense of the poor (Desmond, 2023). Nevertheless, computer code bootcamps, and other educational institutions that invest in this model, draw on the access doctrine (Greene, 2021), a philosophy originating with the Internet boom of the 1990s that suggests access to digital technology will solve poverty. Daniel Greene (2021) writes that schools and libraries appeal to the access doctrine to receive grant funding that help them reinvent themselves into makerspaces and bootcamps. These spaces offer technologies and training that assist the poor. The access doctrine, however, is less useful for making social mobility happen for poor Black families and more attractive as a political tool. The institutions, not necessarily the patrons, benefit the most as they receive a lifeline to remain relevant in their local communities. Because software developer positions open faster than tech companies can fill, some advocates for coding notice an opportunity to finally let some of that wealth from the tech industry come to the racially marginalized people. The coding bootcamp has a simple formula for Black adult learners who answer the call to learn computer programming for work: they get jobs, tech companies get a more diverse workforce, and the United States maintains global leadership in innovative and, supposedly, more inclusive digital technologies. But the structures around computer programming deploys a process of exploiting Black knowledge and Black bodies. Coding literacy learning can continue legacies of using technology to exploit and oppress marginalized people.

I further describe this connection between Black labor and technology from a historical perspective in the following section.

Technology for Black Discipline and Exploitation

Safiya Noble (2018) argues that Google's Search Engine results reflect ideologies of race and gender. Taking inspiration from her groundbreaking work, I searched "Black labor" on Google Images on June 24, 2023, to learn how Google represents Black people working. The first results sprung onto my screen were photos of Black men in black and white prison uniforms working in fields; the other images showed marches in the Civil Rights Movement, such as the well-known I Am a Man photo taken by photographer-turned-FBI informant Ernest Withers. Google's algorithms show commonplace images of Black labor—either working in the fields or working for their freedom. This popular framing of Black people at work simplifies their contributions in the United States. Black labor practices include techné of marginality, which is

> the critical and marginal standpoint from which historically marginalized cultural groups experience the world and then engage rhetorically. When marginalized people navigate systems not designed for their inclusion, they not only apply this critical marginality to the labor that is required to circumvent, subvert, renegotiate the systems for their own survival and success, but they also leave the specialized communication and navigation infrastructures (i.e. technical communication) in place to sustain the labor moving forward. Put another way, a critical understanding of one's own marginality is a way of seeing and knowing, and therefore is a techné—a flexible, dynamic, powerful, strategic, transferrable, transformative tool that can be used to do technical communication work. (Shelton, 2019, pp. 98–99)

Although Cecilia Jackson's framework focuses on the unpaid labor of social movements for Black liberation, I'm most interested in how her theory describes Black labor in the United States as a meeting point among culture, technology, and Black technical knowledge. The distribution of Black technical knowledge, free and enslaved, brought significant wealth throughout the colonial and antebellum periods. In South Carolina, white colonizers knew little about growing rice, but their African slaves used techniques learned in the Rice Coast of West Africa to work the marshy soil into plantations (James, 2006). Black slaves' expert knowledge of land manipulation and water control helped their white masters accumulate wealth for generations from the

seventeenth century until after the Civil War, when emancipation effectively ended rice plantation economies in the South (Carney, 2006). Northern colonial cities became famous because Black people cleared the land first, and then, years later, wealthy whites employed the skills and knowledge of Black slaves as "brick masons, carpenters, cabinetmakers, sailmakers, bakers, coopers, and tailors" (Trotter, 2019, p. 4). Their expertise in ironwork, furnaces, and forges made them valuable workers for building cities that sit on the land their ancestors worked (Sinclair, 2006), land that originally belonged to Indigenous people. Meanwhile, Black women covered domestic service in white master's homes; the occupation came with the twin hazards of sexual and physical abuse (Trotter, 2019).

Although white slave owners did train Black slaves in these skills in the decades that followed, they enslaved Black people because they were technologically sophisticated. But that knowledge also made them a threat to white supremacy. Before ratification of the thirteenth and fourteenth amendments, the United States Constitution categorized Black people as noncitizens, property that was ineligible for filing their own patents. Even free Black people who contributed significant inventions in maritime trade, carpentry, and mechanical engineering struggled to claim ownership of their work. The era of Reconstruction saw an explosion in filed patents from Black inventors, however. So much so that the U.S. Patent Office created an exhibit of inventions from Black people. The list of patents suggests a wide range of occupations Black people had, not just working in the fields but in barbershops, restaurants, and tailoring (James, 2006). I'm painting broad strokes of Black techné of marginality—some coming from West Africa and others created amidst slavery and Jim Crow—but the brief examples here suggest "Black technophilia" (Everett, 2009, p. 20) for and with technological advances going back centuries. White supremacy exploited that Black technical knowledge for wealth, stole Black technical knowledge for their own selfish reputation, and then restricted Black technical knowledge to perpetuate the racist idea (Kendi, 2016) that Black people are intellectually inferior (Jefferson & Forbes, 2022), and that slavery is a civilizing tool that saves Black people from themselves.

Exploitation of and restrictions on Black technical knowledge include *using* technology to discipline Black bodies. These structures kept Black people from doing mental occupations—no education or use of literacy keeps Black people in manual labor or domestic work; no occupation and no literacy means no wealth and no property ownership. In *Dark Matters: On the Surveillance of Blackness*, Simone Browne (2015) examines how race undergirds the surveillance of Black bodies. Brown examines the *Brooks* slave ship design as a type of Panopticon, an architectural structure designed to manage (Black) people using light, shadows, mirrors, walls, and limited space. Slave

plantations used other technologies to monitor and discipline Black slaves: a slave pass system to restrict and monitor Black people's movements, advertisements in newspapers about escaped slaves, and, recalling Patricia Hill Collins (2009), controlling images of Black women to justify economic exploitation in domestic work. White slave masters used literacy as a technology for plantation surveillance and delivered violence when Black slaves failed to follow these literacy practices. When the defeated British Army left New York in 1783 at the end of the American Revolution, they took with them three thousand Black people designated "Loyalists" between April and November. The British Empire published a list of these escapees in the *Book of Negroes*, "the first government-issued document for state-regulated migration between the United States and Canada that explicitly linked corporal marker to the right to travel" (Browne, 2015, p. 67). The book listed, among other things, a physical description of the escaped slave—scars and other unique markers on their bodies. This accurate detail ensured that the British Empire could fairly compensate American slave owners for any slaves the Empire took. A final example: in the wake of an armed Black insurrection in New York, the city council passed lantern laws to regulate the movement of Black and American Indian bodies around the city. Any "unattended slave was mandated" (Browne, 2015) to carry a lantern; the lantern "made it possible for the black body to be constantly illuminated from dusk to dawn, made knowable, locatable, and contained within the city" (Browne, 2015, p. 79).

These methods for discipline and regulating Black bodies would cross over into computing in the early nineteenth century across the Atlantic Ocean. Charles Babbage, one of the key architects of modern computing, used plantation management systems to design technologies that would bring order to labor in capitalist societies (Whittaker, 2023). With the British Empire abolishing West Indian slavery in 1807, the government wrestled with new questions: how does capitalism, productivity, and profit carry forward without slavery? How does capitalism continue despite the worker strikes that were prevalent throughout the Empire? Babbage suggested borrowing the mechanisms and logics of plantation management to control working class whites in factories. The old methods from this management philosophy could easily port over to the rest of economy. For example, employers could keep "records on the number of workers needed to complete a task and [track]their speed, individual outputs per day and per task, the tools and implements required to complete work, and the capacities required to accomplish a given effort" (Whittaker, 2023). Management could divide and standardize labor. This method would create a set of expectations each worker had to meet while on the job; knowing their exact task helped strengthen worker surveillance already present in the record keeping strategy.

Babbage designed his famous Difference Engine to automate hand calculations and create "error-free logarithmic tables, which were crucial in astronomy and for maintaining British hegemony in maritime trade" (Pasquinelli, 2023, p. 52). His concept for this early version of the computer (Babbage would later conceive of the Analytical Engine, its successor, with Ada Lovelace) drew on labor division techniques in factories, which they had borrowed from the plantation management system. Babbage assigned each part in his invention a single task, and when brought together those parts and tasks constituted a machine. The punch cards carrying instructions came down from upper management, and the workers would insert those cards into the machine itself. Those same workers would also take responsibility for making sure the machine worked. The creators of the punch cards maintained their power: they had the knowledge necessary to operate the machine, while "the computers" were unskilled monitors of the machine. From their (literal) high vantage point, management could surveil the "computers" below to ensure productivity. Work remained regimented, consistent, and predictable and thus could be automated (Whittaker, 2023). Computing continues a legacy of plantation surveillance through its process of individual tasks (functions) working together to run software. Ultimately, Babbage took inspiration from plantation management and theorized how machines may *automate* tasks in production.

Babbage's ideas came to fruition throughout the 20th century in Britain and the United States. Gender, class, and race solidified Babbage's hierarchy for automated production. Machine work in the British Civil Service "disciplined workers in accordance with certain gendered and classed labor ideals predicated on the heteronormative concept of a male breadwinner wage and unpaid domestic work for women within the nuclear family" (Hicks, 2017, p. 22). These ideologies of gender and class shaped the kinds of work women did in Britain before and during World War II and then in peacetime when the government wanted to leverage computing to regain its lost power and influence. The British government believed data processing on electromechnical computers was low-skilled manual labor suitable for women. Realities of their labor portrayed both Babbage's and patriarchy's expectations: machines like the Colossus were incredibly complex, and data processing required as much intellectual work as the management and supervisor office work men did (machine work was thought to be subclerical, the bottom of the bottom of Britain's war effort and subsequent peace time expansion of computing). The mental and physical work of women codebreakers led to the D-Day landing on Normandy, a major turning point for the Allies. Yet women's significant contribution would be hidden in future representations. Women's machine work would be rendered "Taylorized and skill-less" in future discourse,

depicting machines as working on their own while women simply "tended" to their maintenance (Hicks, 2017, p. 43).

In the United States, a competitor of Britain in the global computing market in the 20th century, software, gender, and labor had a less top-down expansion and exclusion. In the 1940s and 1950s, many firms invested in computer hardware, anticipating its revolutionary change to everyday life and work; the role of the computer programmer, however, was simple low-skilled clerical work. Software was not as valued in computing during the mid-20th century. Like in Britain, men computer engineers took over the most important steps of the programming process. Step six—"static coding", according to the authors of *Planning and Coding of Problems for an Electronic Computing Instrument*, was women's work (Ensmenger, 2010, p. 36). Follow the plan the man has made. However, the computer programmer role required more complicated thinking than anticipated, and they soon joined all steps of the software development process. New programming languages like FORTRAN, COBOL, Algol, and Unix helped solidified their needed contributions (Abbate, 2018).

However, the programmer also challenged existing hierarchies (Ensmenger, 2010). Although coding transformed into a central role by the 1960s and beyond, the initial model still echoes Babbage's vision of monitoring labor. Modern digital technology both automates tasks and surveils workers. For example, Amazon notoriously surveils workers in its highly automated wish fulfillment centers (Delfanti, 2021). Recalling Silicon Valley's labor market, digital technology design processes encourage short-term contract work for specific tasks. The place of the software programmer looks different from what Babbage conceived, and the reality of their importance is well-accepted in modern technology design. However, this historical look, though brief, shows how race, technology, and labor centers whiteness. Black adult learners learning coding literacy must buy into this ongoing legacy if they hope to succeed. Chapter 3 and 4 demonstrate how participants wrestle with using computer programming for their self-defined form of liberation and the white-centered interests of the industry. The Conclusion concedes that the tech industry, not just software development specifically, has revised expectations and practices for many kinds of people in the past, but the process for challenging these legacies and adapting to Black coders remains a steep hurdle.

The struggle between whiteness and labor as empowerment for racially marginalized people shows in 20th-century recruitment efforts. Like in the 21st century, industry professionals believed there was a shortage of computer programmers. Many corporations had come to rely on these highly skilled technology operators by the 1960s, and that necessitated more workers. Historians now question that wisdom, a skepticism we may have now, as, like the literacy crisis, there is always a software crisis. (There is another kind of

software crisis, in which engineers had a problem with developing software, from getting work done on time to getting advanced technologies to complete desired tasks. In this book, I'm referring to the crisis of needing more workers.) Back in the 1960s, the desire to solve the so-called software crisis overlapped with intense scrutiny on the diversity of tech companies. In 1968, the newly formed US Equal Employment Opportunity Commission (EEOC) called in New York's top corporations to explain the lackluster effort to diversify their workforce. Most notable on that list was IBM, which was then a major distributor of computer technology to businesses across the nation (McIlwain, 2020). Four years before, IBM began the Fort Rodman Experiment, a government-supported project that turned a military base outside a Massachusetts majority white community into a technical education program. The program would train 750 Black and Brown poor high school dropouts in computer programming each year. For fourteen months, these young people from across the country would live, eat, and learn coding together in small cohorts. White college graduates, some of them having served in Peace Corps, taught the courses.

IBM was ahead of the curve but not the only one trying to train Black people. In that same year, The *New York Times* published an article on how coding could be attractive to Black people, and in 1967 the Commerce Department started a program to recruit and train Black men in coding, arguing that, race, class, or gender mattered little in tech; they could work and earn money on their merit alone (Abbate, 2018). Computer code bootcamps across the country sprung into being, as many as 700 by 1969. Computer programming was advertised as a source of empowerment in addition to social mobility. However, trade schools and electronic data programming (EDP) schools failed to deliver on these promises. In her article on the historical link between EDP schools and modern computer code bootcamps, Kate Miltner found that a "combination of fraudulent practices, inferior quality training, poor reputations, and larger structural biases" coalesced as barriers into software development for marginalized people (Miltner, 2022, p. 266).

IBM's Fort Rodman Experiment failed for several similar reasons, including deficit views of the young Black men they trained and complaints from the local white community that they didn't want Black people around their neighborhood. President Lyndon B. Johnson would fall in line with racist demands and shut the program down. However, that didn't stop IBM from trying other training programs. In the 1968 commission hearing, IBM wrote a letter to the EEOC boasting about its efforts to recruit and hire racially marginalized people. Their efforts to diversify their work force created barriers to maintain whiteness. IBM's Programmer Aptitude Test, for example, "reinforced the idea that computer programmers were born not made. Blacks who failed to pass

the test were seen as unteachable" (McIlwain, 2020, p. 34). And during a 1974 speech to the company board and stockholders, CEO Frank Cary spoke highly of their diversity programs but admitted that whiteness was strong among the managers. They frequently asked Cary how they could hire more racially marginalized people without undermining racial hierarchies, with Black people being subordinate to white people. Computer code bootcamps as sources for adult education may perpetuate institutional racism; appealing to market logics without interrogating race, and other forms of inequality that the industry reflects, advances nothing for Black people and other marginalized people. Identity-based projects more readily address structural inequality and racial stereotypes, such as Dream Corps TECH, Code as a Second Language, and Black Girls Code. They provide a counternarrative to the assumptions and beliefs about race in dominate discourse about coding. This study examines how Black people develop new discourses and practices from attending a computer code bootcamp that tries to get both racial justice and inclusive workplaces. It describes what happens on the ground for low-income people looking to develop their literacies for social mobility and well-being. In doing so, a more complicated and progressive story comes to the surface.

Limitations of Coding Literacy and Paths to Liberation

I suggest that interests in computer programming for liberation overlaps with literacy studies' interests in reading and writing. Some concepts from the field can show that the coding movement already rests on shaky theoretical ground. These concepts also show why the racial view on everyday Black people in computer code bootcamps helps create an accurate picture of coding literacy's ties to racism and labor. First, the coding movement updates the literacy myth, which originally theorized the belief that reading and writing is necessary for a range of positive life and societal outcomes, such as economic development, democratic practice, and upward social mobility (Graff, 1979). The myth of reading and writing, and later digital literacy broadly throughout the 1990s, has evolved into a coding literacy myth in 2012 (looping back to the 1960s' coding movement, too). The literacy myth turns the word "literacy" into a god-term that, once attached to an adjective, makes anything essential (visual literacy, financial literacy, film literacy etc.) (Wysocki & Johnson-Eilola, 1999) to galvanize powerful politicians and funders to advance the movement's mission. Code.org calling computer programming a new literacy, as essential as reading, writing, and arithmetic raises eyebrows and opens pocketbooks.

Unlike the ways "literacy" gets thrown around in public discourse, coding *is* a literacy; it *is* a type of writing. As a form of writing, computer

programming works not only as a cognitive skill but also a social and material practice; coding operates alone as a method of communication while also being the foundation for how we write digitally (video, audio, images, etc.) (Vee, 2017). Computer programming is symbol system that develops meaning for human beings and computers, which can act on the "flow of information through social systems"; what information matters becomes reality for digital platforms themselves, shaping how people interact with each other across space, time, and geography (Ko, 2016, p. 33). Computation awards power to programmers for controlling "others' computers, and by extension, designing and deciding how people experience the extent of their lives" (Ko, 2016, p. 33). A social view of literacy, then, will steer away from treating computer programming as a "magical entity" that speaks for itself, a neutral moving target flowing through histories of literacy; instead, literacy studies recognizes computer programming as subject to human beings' "social and machinic rituals" (Chun, 2008, p. 311). Critical race studies unveils meritocracy and objectivity from tech to find the moves everyday low-income Black people make when they encounter computer programming.

The expansion of coding literacy creates a mentality or pressure that others need to learn computer programming (Vee, 2017). Literacy campaigns leverage the above concepts or rather the above concepts steer literacy campaigns like the coding movement: the myth that coding is a panacea for social ills, the necessity that everyone has it, and coding is a type of writing with power in our lives. Coding literacy campaigns connect local context with efforts to build or strengthen national defense and the national knowledge economy. They also target populations who have been historically left out of literacy education. The responsibility to strengthen a nation through economic productivity passes to Black and Brown people, women, LGBTQ+ people, the poor, and their intersecting social identities, who need to keep up. The irony is that they fell behind because an oppressive state for decades told them to *stay behind*. Coding literacy campaigns do not pay an education debt for years of institutional exclusion (Ladson-Billings, 2006). Instead, computer programming, like reading and writing, "serves as a badge, a sign of initiation into a select group" (Arnove & Graff, 2020, p. 439). Hence, Code.org, and tech companies like Apple, swoop down into states to spread the gospel of computer science education; they offer resources and funding to hire and train computer science teachers. Individuals create bootcamps and partner with local and major tech companies to design curricula that meet industry standards and form a pipeline for bootcamp graduates to join a prestigious class of people. The coding literacy campaign recognizes disparities in the tech workforce across gender, race, ethnicity, and sexuality and so targets these populations to get them onboard. The extent to which they achieve their goals—whether

for empowerment or further control over marginalized people into pre-made roles—gets messy when marginalized people assert agency with coding literacy. They can either use computer programming according to the plan of their sponsors or resist and find new pathways. In some cases, as I discuss in Chapter 4, they have no choice but to pivot because the opportunities dry up or are too chained up.

My point in this section is to show just how much the coding movement attracts literacy studies. Code.org, and other organizations leading the campaign, dig deep into literacy history, perhaps unknowingly, and look extremely familiar to scholars like me. Computer code bootcamps are just a piece of many social and material resources sent to communities of color. Computer code bootcamps stand on the front lines of tech labor and the economy. They align with a familiar history of reading and writing's social meanings from age to age and share in a longer history of technological exploitation. For this reason, I journey to understand how the most vulnerable members of Black communities interact with these institutions and how they position themselves in this new turn in our social history of digital literacy.

The conceptual background here shows how technology as utopia play out *against* Black people and labor. The promises and hope of computer programming have been withheld selfishly in the past, and despite efforts to engage Black people in coding now continues that exclusion. In other words, the digital literacy myth was never meant to help Black people; Black people were meant to be subjugated and exploited to perpetuate that myth for others to believe in. What computer code bootcamps and other literacy campaigns do is offer fantasies, not hope. I'm reminded of Alex, one of my participants attending Clearwater Academy in spring 2017, who critiqued half-done racial justice in the United States. He argued that the Emancipation Proclamation, the Thirteenth Amendment, and the Fourteenth Amendment had not delivered total justice for Black people. I think this exchange between us represents his ideas better than any summary or paraphrase:

> **Alex:** I'm an African male captive in America … Well having been. Ok. Well, shit. Yeah. To give a little further explanation of that: If you take a zebra in the year 1920 and you took the zebra from Africa and then put it in a zoo in Canada. And then eventually you let it and all of its babies out of the zoo. Would it be a Canadian zebra?
>
> **Antonio:** No. [laughter]
>
> **Alex:** No? Oh okay. [laughter]
>
> **Antonio:** Well, it's not from Canada, right? [laughter]

> **Alex:** Hell nah, it ain't from Canada. And I'm not from America. We ain't come from here. We ain't come from here. We was captured and brought here. And then let go. And still here. So I am a descendent of African captives. An African captive in America. 'Cause they ain't never talking about sending me back. When have they paid for me a plane ticket? When you get released you, get sent home! Unless, of course, your home has been decimated and destroyed and all the records of your existence and history has been washed from the history of the Earth. I mean are you fucking kidding me? Yeah, I'm an African captive in America. To me, if to nobody else.

I know I'm suggesting that I align myself with Afropessimism, the idea that Black life is ontologically always a social death. From my multiple engagements with Clearwater Academy's thoughtful instructors and from having at times intimate conversations with Black participants and other adult learners attending the computer code bootcamp, my stance is that structures as they are do not work. We need something new. I align with and take inspiration from Adam J. Banks' work on how Black people seek transformative access with digital literacy practices. His explanation I quote at length:

> African American rhetoric, then, is intended to document the ways Black people have hacked or jacked access to and transformed the technologies of American life to serve the needs of Black people and all its citizens. … By transformative access, I mean that African Americans have always argued for a genuine inclusion in technologies and the networks of power that help determine what they become, but never merely for the sake of inclusion. African American rhetorical practices call attention to the ways that the interfaces of American life, be they public facilities, education, employment, transportation, the legal system, or computer technologies, have always been bound up in contests over language, and have always been rhetorical—about the use of persuasion, in these cases, toward demonstrably tangible ends. (Banks, 2006, p. 45)

Transformative access shows that literacy, despite the mythic quality literacy sponsors give to it, has the potential to intervene in social inequalities. That isn't necessarily within hegemonic power structures, social institutions, and the systems created to control how people perceive and interact with their social reality. Instead, the intervention comes through revelations and clarifications about what's in front of us but it's so mundane we don't give it total

thought. Black coding Discourse about coding literacy and the Black tech ecosystems that Black adult learners in this book create twists the relationship between labor and race slightly. The study participants say, "I am not just *becoming* a coder; my *relationship with* labor and tech is changing." This nuanced look at literacy and Black labor in computer code bootcamps details how Black adult learners develop knowledge and practices out of their interacting with computer programming. I investigate the downstream impact this knowledge has on their lives that's not completely considered in popular assumptions on what coding literacy should do for Black people. *Black Tech Ecosystems* delivers critical imaginings of Black people discovering the truth of their knowledge and definitions of labor using coding literacy as an intervention tool. In the following section I discuss my study's context, data collection, and methods for analysis. I also briefly introduce you to the participants. I give some theoretical attention to racial matrices, which makes my using "Black" to describe participants more complex for this study design and its analysis. Finally, a special note: the names of all people, cities, and schools in this study have been changed. I have renamed the city where I conducted my research Sakowin. This acknowledges that Clearwater Academy resides on the ceded lands of the Očhéthi Šakówiŋ. The size of this territory provides confidentiality on the exact location of Clearwater Academy.

Clearwater Academy in Context

In the early 20th century a few women brought to the upper midwestern city Sakowin the Social Justice Cooperative (SJC), a nationwide movement to fight racism, sexism, and poverty. The movement had begun in Europe in the century before. These women established a Sakowin chapter, and over a hundred years later in 2014, it established Clearwater Academy as its latest justice-informed program. SJC adopted the growing computer code bootcamp model and wrapped it around equity: recruit low-income racially marginalized people and women to train them in web design over an intensive three months. They would be an important resource in a small, thriving, and growing majority white tech hub. Between 2014 and 2019, the workforce in the tech sector grew by nearly fifty percent; by the end of the first year of the COVID-19 pandemic, technology publications reported that Sakowin had the largest migration of tech workers in the United States. A major research institute listed Sakowin as one of the best cities for future innovations in tech. Entrepreneurship in tech was a major attraction.

An internationally known local research university called Sakowin University fueled this innovation with its sophisticated computer science and business programs, vast connections with national and international major companies, and stellar research faculty; throughout the city startups popped

up left and right, and an incubator space in downtown Sakowin encouraged young ambitious entrepreneurs to play around and experiment with business ideas of their own. One of the largest healthcare software companies in United States was founded just outside the city. With a large well-funded research university in Sakowin, many computer science graduates could gravitate to that company. But the drawback with hiring young computer science majors was that they tended to leave town. Get a fantastic education. Get some work experience. Make a lot of money. Pay off their student loans (if they had any) and then jet to the biggest company they could find. A "brain drain" was a problem in Sakowin. Despite the possibilities of tech innovation and social mobility, Sakowin was still burdened with significant disparities. The story was typical of many progressive cities in the United States: Black people were poorer than white people; the city, and its state, incarcerated more Black men than white men. Sakowin professed to white liberal progressivism, but residents often had a Not In My Backyard (NIMBY) mentality.

Clearwater Academy positioned itself in this thriving tech hub as an opportunity creator to address some of these disparities in the city. They partnered with local tech companies to know what skills and competencies were needed in the regional labor market. Clearwater Academy's instructors developed a curriculum around those needs. The computer code bootcamp would provide something the university could not: local diverse talent that intending to stay and live in the city. Clearwater Academy had another advantage: it was one of the few accredited computer code bootcamps in the nation. In the industry's early days, the promise of computer code bootcamps was in doubt because many were not vetted by institutional accreditors like the Higher Learning Commission; these bootcamps had no standards to follow other than what tech professionals told them would be needed in their content. But Clearwater Academy had partnered with a respected local community college; adults graduating from Clearwater Academy could use their credentials for credit hours at the college should they want to try for an associate degree. They didn't have to struggle as much to find a clear pathway into college. The associate degree could be a ticket into attending the Sakowin University, or they could get a good job. Working in tech was the ideal but getting any higher paying job was the more realistic goal.

Clearwater Academy's curriculum split between two skills covered by two instructors. Richard was the technical skills instructor. He had two firsts under his belt: one of the few Black men to design websites during the dot-com era of the 1990s, and one of the first ones to get a Gmail account. These days many users must create email addresses by stylizing their name (using periods between first name, middle name, and last name, adding numbers, or making up some other name, for example) so the address is unique. But if someone's email

is just their name—no styling, no numbers—they were probably the first to get a Gmail account (or they have a unique name). That was Richard. His email address was just a sign of how long he had designed websites for businesses before deciding to give back through community teaching. Richard trained adults in web design using HTML (Hypertext Markup Language), JavaScript, and CSS (Cascading Style Sheets) over the intense three and a half months. (Note that HTML is a markup language. A markup language defines and creates a document and can fill that document with text, and CSS helps style the text and bring in other multimodal elements like images; programming languages give instructions to computers to automate tasks. Computer programmers would not consider HTML or CSS programming languages.) These three languages, however, were just the minimum for adult learners to learn.

Richard encouraged adults to learn other languages while attending Clearwater Academy. He could provide resources to get them started, but he would not teach them any scripting language or programming language other than web design. Richard followed Google's learn how to learn model for pedagogy; that was an essential skill for any coder.

Adult learners in the program used a variety of tools to awaken and sharpen their coding practices, but FreeCodeCamp was the primary tool. The popular nonprofit offers hundreds of online activities and projects across multiple areas of computer programming and tech. After completing several hours, users can receive a free certificate. As of July 2023, the website boasts that 40,000 graduates have completed their courses. Code Academy was another tool for learning web design, although it was not as often used and was soon abandoned during my visits in 2017. Like FreeCodeCamp, Code Academy offers easier exercises in web design but provides no certificate. Wordpress was the central tool for projects in class, although adult learners could branch off and create their own website or app from scratch. To bring them fully into the software process, Richard taught adults how to design logos, résumés, websites, and mobile apps in the design program Sketch before coding them into existence. Once a week, volunteer professional coders visited Clearwater Academy for one-on-one tutoring sessions.

Jessica was the case manager and employability skills instructor. After completing a degree in spiritual formation, Jessica spent a year working for a church. For her "it was awful," so Jessica switched to business. While she enjoyed working in that world, Jessica felt inspired to give back, and she switched to child protection services. The job wasn't the right fit for her either. Jessica found her way to Clearwater Academy. She had no idea what she was doing, but her starts and stops in social work, learning how human development works, and working in the business sector all came together at the computer code bootcamp. Richard thought of her as the project manager between

the two of them "because without her, I would be lost." Employability skills included résumé and cover letter writing, mock interviews, elevator pitches, collaboration, problem-solving, wage negotiation, and networking (virtual via LinkedIn and in-person).

Some of the project management frameworks in software development like Scrum solidified collaboration and problem-solving skills. Clearwater Academy most resembled a worksite in its attendance policies. Bootcamp trainees needed to arrive on time for "work" each day and behave like professionals, although they did not have to dress professional all the time. To graduate, they needed to log 400 hours of work time. If they missed some hours, the trainees could make up for the time by writing blog posts or attending Meetups—activities, gatherings, and events for people with similar interests that occurred in a variety of locations throughout Sakowin. Meetsups were opportunities to network with other coders or professionals in the industry, so attending these was required in general, too.

Throughout the three months, Richard and Jessica took adult learners on tours of local tech companies, where they learned and witnessed the inner workings of the industry. Speakers would visit to discuss a variety of life topics from finance and budgeting to time management. Richard and Jessica understood that their program was intense and was asking a lot of adult learners: instead of being at work making money, spend your work week learning something with no pay. Many adults were poor, had many life responsibilities outside of the computer code bootcamp, and had limited resources. Clearwater Academy offered limited social support services: gas cards, bus passes, rent assistance, and access to career services were all in place to ensure most adult learners would complete the entire semester. Teaching coding and employability skills was a collective effort between Richard and Jessica. Both were always in the room passing off teaching responsibilities according to their lesson plan. They were sincere and gave lots of tough love to adult learners slacking off and falling behind. The classroom atmosphere flowed from serious and professional to fun and light-hearted. Other than the desks facing the front of the room (which could be rearranged for group work), I most clearly understood Clearwater Academy as a worksite when an adult learner wasn't behaving professionally (falling asleep in class, talking out of turn, being late, etc.).

For the first two or three years, Clearwater Academy had a rough start. The program had to hunt for trainees. Instructors and staff put up fliers around town and used existing career services and other social support programs to bring in adult learners. Retaining those adult learners was just as hard. A cohort of 25 adult learners could drop to fifteen or ten in just a few weeks. Childcare, housing, healthcare, mental health, and run ins with the law could cut off low-come adults from access to coding literacy And those who made

it to the end had a bigger hurdle: the instructors before Richard and Jessica focused on teaching web design, neglecting employability skills. So, when those graduates presumably had no idea how to behave in the workplace: they might try to cook fried chicken in the break room, sell marijuana to a superior, or go on multiple smoke breaks.

Richard and Jessica had a lot of work to do when they appeared on the scene. Having been one of the first Black men to leverage coding into a lucrative career during the 1990s, Richard brought with him a reputation that tech companies could respect and trust. And Jessica had experience in social work to provide emotional and social support. By the time I arrived at Clearwater Academy in 2017, the computer code bootcamp had earned its reputation in Sakowin. They had gone from hunting for recruits to being flooded in referrals, many of them from alumni telling their friends and family to attend. The retention rate for the first class of adults was thirty percent; by the fifth class in 2016, retention increased to ninety-one percent. Many tech companies were delighted to partner with Clearwater Academy to further the diversity mission. Four years after I completed my study in 2018, Clearwater Academy remains strong, welcoming new cohorts of adult learners even through the COVID-19 pandemic by offering online options. They have since spread their training model to other Social Justice Cooperative chapters nationwide. And that wage problem? Bootcamp trainees now receive a wage grant that pays them fifteen dollars an hour while they attend Clearwater Academy. Richard and Jessica have moved on to other jobs and no longer work for Clearwater Academy, but they left behind a legacy of change.

Finding and Joining Clearwater Academy

A friend in one of my graduate seminars connected me with Clearwater Academy. She had heard about my interest in studying Black coders, and I was having a hard time finding them (not surprising given I was in a majority-white city attending a majority-white university). I first attempted to access Black coders at the major healthcare software company outside of town; I was lucky enough to email someone in their communications department who told me they would investigate how they could help. They never responded to my follow up emails. Clearwater Academy, however, was different. My friend had volunteered at the computer code bootcamp and knew Richard well. She could introduce me to the executive director of the local SJC chapter. With a memo of understanding in my hand, I spoke with the director honestly about how my interest in learning about coding and social justice aligned with Clearwater Academy's goals. I could not promise any insight on the effectiveness of their curriculum design; however, I could, in a small way, bring

to light a model for computer code bootcamps that could change conversations on coding literacy education for Black adult learners. With approval from my university's institutional review board and formal permission from Clearwater Academy, I began my year-long ethnographic study.

Recruiting participants was straightforward. On the first day of class for both the spring and fall semesters of 2017, I pitched a simple idea: to gather stories about Black people learning computer programming so that others—tech companies, other computer code bootcamps, and computer science teachers—can learn how to welcome Black adult learners into software development. In the spring semester, seven Black-identified adults agreed to participate. In the fall semester, five agreed to participate. I had no money to offer them, which was a questionable ethical conundrum for me. These were low-income Black people giving some of their time and energy to speak with me, to allow me to do observations, and to collect their literacy artifacts (résumés, cover letters, blog posts, copies of class notes, documents that supported their brainstorming of ideas, etc.). I offered my skills as a writing instructor in return. For three months in the spring and again in the fall, I brought university-level training in teaching to help participants with writing their résumés, cover letters, and blog posts, and with practicing their elevator pitches. When time came for them to formally practice their elevator pitches, Richard and Jessica asked me to weigh in on their performances. I refused to withhold my assistance from other non-participating adult learners; anyone who wanted help got it.

Although I shared racial identities with all but two participants, I could sense that I experienced race and class differently from them. For example, late in the 2017 spring semester, I met with Kevin and a few other Black adult learners during breaktime, and we struck up a conversation about our childhoods. Kevin recalled eating government cheese. In 1981, President Ronald Reagan signed the Agriculture and Food Act of 1981, which included a provision to distribute five hundred and sixty million pounds of cheese the government had been stockpiling. States could request the cheese to give to welfare recipients, Food Stamp recipients, people on social security, the elderly, and community organizations like churches. The government cheese plan so happened to coincide with Reagan cutting the federal food stamps program's budget, so handing out processed cheese was a weird substitute for real food. Nevertheless, Kevin remembering government cheese drew a line between us. My parents grew up poor in rural Alabama, but they navigated racism to reach a middle-class life. I didn't eat government cheese growing up; I ate real cheese.

As I interviewed these participants and talked to them informally, I noticed how my own upbringing could influence my analysis of their experiences.

My experience could lead me to wonder why these Black adult learners had not done better or to judge them for making a series of life choices that led them to this moment—Clearwater Academy. But reading scholarship, attending conferences, and listening to classmates throughout coursework taught me that the choices Black people make respond to structural racism. What I witnessed was a form of Black technical knowledge brought on by years of navigating a racist system that led them to put hope into computer programming. I could not resist that system either. I was a Black graduate student in a majority white city in a state with the highest rate of incarceration for Black men in the country. The gap between us was tenuous and small at best. Having such a small yearly income, I could sense that one choice—or a cascade of expensive events—would put me on the same path as them. By doing in-depth analysis of hundreds of hours of interviews and field notes that cover 200+ hours of participant observation, and then writing them into this book, I have strengthened my joy for Black life in the United States.

Although I use the word "Black" in the title of this book and throughout its chapters, the word has more complexity in this context, and in the context of the diaspora in general. It's well-documented that race is a social construction, and the United States distributes privileges, rights, and resources according to a perceived hierarchy of worth, placing white racial identities at the top. But even the definition of white is a moving target. Race can be a catch-all term that too neatly categorizes people as having a consistent identity. This perspective can leave conflicting dimensions of race unaccounted for. One dimension frequently used by sociologists, and literacy scholars like me who tend to borrow theories and methodologies from across the humanities and social sciences, is racial identity and racial self-classification. Racial identity is a person's subjective view of themselves while racial self-classification is the official answer someone gives on a survey or close-ended question (Roth, 2016). While I did rely on racial identity to recruit participants, I ran up against other dimensions of race that shaped how some participants identified themselves: observed race and reflected race, how others view your race and *your understanding* of how others view your race respectively. Thus, a complex web of identification came to light for three participants.

During my call for participants, I used the word "African American," a term I thought unproblematic. My conception of African American was quickly challenged by three adults. First, Nadine, a single mother attending Clearwater Academy in spring 2017, was from Sudan but came to the United States as a refugee. Other Black people saw her as African and white people saw her as African American. I write more about Nadine in later chapters but suffice to write here that Nadine identified with the African American experience in the United States based not on who she was—Sudanese—but how

others treated her in a weird space between two worlds. In the fall 2017 cohort I met Pierre whose mother was Black and his father Irish. During a literacy history interview, Pierre felt that white people treated him as if here were completely Black, based on frequent microaggressions from his co-workers at a restaurant. Although Zeus was the son of Cuban and Spanish parents, his phenotype—the color of his skin—marked him as a combination of white and Black. In this book he jumps between self-descriptors of his race: mulatto, (as read at the start of the Introduction) and Mexican (quoted in Chapter 3). But found himself in life often framed as a Black person, an identity and experience he could not separate from his ethnicity. Once a Nigerian friend in the military even called him white, which was a shock to Zeus. If that was a consistent view from everyone, he joked, he could've then leveraged that identity for some privileges and awards.

Each racial dimension can reveal different experiences with race and new theoretical and methodological insights. They trouble my notions of African American, Black, and Black American. "Black" comes with a small asterisk; its definition encompasses the self-identification of adults and those adults who have coded themselves as Black because their social experiences, and not their racial identity itself, defined so much of their existence. I move from African American to "Black" to include the diaspora whose many racial identities, and racial dimensions, results in part from the subjugation of their ancestors at the hands of white colonizers.

This book reports on a year-long ethnographic study at Clearwater Academy. To understand how Black adult learners labored in a computer code bootcamp I used a diverse set of methods at my disposal: literacy life history interviews, participant observations, document analysis, and ecological theories of writing (this method described in detail in Chapter 2) helped me cover the complicated twists and turns of learning how to labor in Clearwater Academy. At the end of each semester, I asked participants if I could do a follow up on how Clearwater Academy may have changed their lives: In what ways did they end up using coding literacy and to what ends? Here the concepts learned from Clearwater Academy had a chance to be seen in action three months and then six months after. Throughout the following chapters, I rely primarily on interviews and informal conversations with participants, but I also draw from descriptions and reflections from my field notes and official documents from Clearwater Academy to ground my analysis in their context or augment my analysis to drive home my argument. As readers can imagine from my brief positionality statement above, I also bring in my personal experiences learning Python or my own relationships with participants to give greater detail and granularity to the picture of what it means to be Black in a computer code bootcamp.

Critical discourse analysis (Gee, 2011) and grounded theory (Charmaz, 2014) help me arrive at the concepts I argue about throughout the book: Black coding Discourse and Black tech ecosystems. Critical discourse analysis postulates that language doesn't just convey information; it reflects our sense of doing and being in the world among others. However, language also accrues power within communities. The social structures of our world, the institutions that protect those social structures, and the inequalities that can result from self-interest get tied up to how we name and describe people and our interactions with them. If discourse helps shape worlds, it can also intervene in social and political issues. Critical discourse analysis investigates how people use language for transformative change. When Black participants describe the coding practices and sociocultural contexts of software, they name possible worlds for themselves: what the current logic of software development might do to them as Black people and what they can do differently from that logic. As they work on coding and learning employability skills from the tech industry, Black participants in this study construct new ecosystems that suit them. New practices for surviving and thriving using technology spring to life and they develop a different discourse that reflects what's happening in that ecosystem. Grounded theory as a method of analysis helps me deeply investigate the complexity of language and meaning to understand Black participants' motivations, values, and beliefs. Line-by-line, and sometimes in chunks of sentences related to one another, get coded and recoded into categories and themes that describe what's happening for these Black adult learners. Events I witnessed and wrote about in field notes provide a richer tapestry of what coding literacy means to Black adult learners in Clearwater Academy from the interviews. I detail an assets-based study that calls for pathways toward a different future for computer science education.

The methodological diversity I draw together—literacy history interviews, individual and focus group interviews, observation, ecological theory of writing, and document analysis—are related yet distinct methods that allow me to view in-depth the lives of Black adult learners in a computer code bootcamp. In, *Qualitative Literacy: A Guide to Evaluating Ethnographic and Interview Research*, Mario Luis Small and Jessica McCrory Calacro (2022) argue that exposure is the bedrock of a strong ethnographic study; therefore the number of participants may not matter as much as the amount of time spent with them. Although participants in this study are small, the multiple methods I use allow me to find multiple contours of Black coding Discourse and Black tech ecosystems that flows in and around their lives in-depth. Interviews capture narratives, personal backgrounds, values, beliefs, and motivations, but participant observation and literacy artifacts deepen my understanding of the knowledge, processes, and practices Black adult learners gathered from their time in Clearwater Academy

and how they applied these ideas in their lives after graduating. Their storied lives reveal motivations and beliefs for the practices they use before, during, and after attending a computer code bootcamp. These uttered discourses reflect the world they desire and seek to create through a complex ecosystem of people, objects, and emotions. These two in-depth discoveries—Black coding Discourse and Black tech ecosystems—form the chapters that follow.

What You Can Expect: An Outline of the Chapters

The book describes Black adult learners' relationships with each other, with themselves, with their families and friends, and the worlds that structures these relationships when they voluntarily enter Clearwater Academy. It treats computer code bootcamps as a key touchpoint in Black adult learners' participation in the coding movement. All these forces and the bootcamp structures their relationships with coding literacy and how Black adult learners leverage computer programming in an economy that supposedly is poised to reward them. *Black Tech Ecosystems* tells a complicated empirical narrative of Black knowledge and lived experience applied to coding literacy education for work. This approach allows me to pay attention to the material and social circumstances that govern their flow through digital ecosystems as historically excluded designers and co-designers of digital environments.

Chapter 1 describes the literacy work histories of Black women adult learners attending Clearwater Academy. While society in the United States often malign low-waged work, I find that these women's patterns of low-waged work contained significant digital literacy practices. Oppression from one job position to the next only solidified their expectations for labor and tech, and these desires led them in part to Clearwater Academy as a step toward new imagined worlds. This chapter shows that conceptually digital literacy links to motivations for coding literacy, and coding literacy becomes a tool toward healthier familial relationships and the kinds of labor that rewards them independence and flexibility. Chapter 2 describes how Black adult learners bring together the infrastructures of Clearwater Academy and the networks of their own lives to foster carework practices to stay plugged into an intensive curriculum. To understand how low-income adults revise their lives for three months of training in computer programming, I use network maps which help emphasize how learning coding literacy amidst the material consequences of racism is highly contextual and may vary from adult to adult. This chapter demonstrates how a computer code bootcamp that centers Black desire can influence the literate lives of Black adult learners.

Based on separate in-depth group interviews with Clearwater Academy's instructors and with Black participants, Chapter 3 suggests that Clearwater

Academy "codes" Black adult learners as "functions" that can fit into existing software programs created by majority-white companies. Rather than disrupt their software programs, Black functions seem to assist in perpetuating whiteness in tech. Interviews with instructors and their adult learners reveal that they struggle with reconciling efforts to create racial justice through coding with the ideological and economic benefits to majority-white tech companies. Chapter 4 considers the realities of transitioning from a computer code bootcamp to the workplace as a Black coder. Drawing on the post-graduation lives of four participants, this chapter demonstrates that, unlike the rhetorical claims explored in the Introduction, coding literacy itself does not help Black adult learners overcome the sociomaterial and cultural barriers to social mobility. However, the work-based coding literacy they did learn continues to echo in their lives in other ways and promotes sustainable lives. Their learning coding literacy also gave them clarity that other literacies already exist in their repertoires and could afford more opportunities than computer programming.

In the conclusion, I reflect on the drama that unfolds among coding literacy myths, computer code bootcamps, and the digital cultural competencies Black adult learners learn about coding. First, I summarize the core of the book: the study of Black coding Discourse in computer programming reveals knowledge, values, and practices that facilitate a desirable Black tech ecosystem. Escaping from the tech pipeline, Black adult learners frame computer programming as a type of writing distinct from other kinds of digital literacy practices yet no better rewarding than existing relationships and Black literacy and rhetorical practice. Then I switch from theory to praxis: I suggest computer code bootcamps may be better equipped to center and draw inspiration from Black adult learners' socio-cultural resources and values to guide curricular design. Vocational training programs may use a critical race technology theory framework (Tanksley, 2022, 2023), which challenges stories of technological progress with teaching in-depth how technologies have often developed under a white racial frame to serve stratification and oppression. Learning coding, then, is not merely an economic opportunity but one that purposely undoes this ongoing legacy in their own lives. An anti-racist computer code bootcamp suggests Black adult learners develop cultural competencies about computer coding and bring those frameworks into the design of technologies. Recognizing and supporting the ways Black adult learners fulfill their techno-lust for coding to find survival and sustainability, based on these participants' lives, is a starting point for such interventions.

Chapter 1. The Work Ethic of Black Women Coders

> In other words, knowing a woman in STEM can have substantial impact on young girls' sense of ability and opportunity regarding a field like computer science. It's called the "snowball effect." The more women working in STEM, the more likely girls can see them as role models who can aspire to emulate.
>
> – Watkins, 2019, p. 133

> For Black women to feel like they belong in computing, they need to acknowledge their whole self, realizing there is no hierarchical structure for oppression.
>
> – Solomon et al., 2018a

To be in Clearwater Academy, you must prove you are poor. Work history, and other kinds of documentation, like tax returns showing income, proved to Clearwater Academy that the right people were getting the resources meant for them. Applicants show on their résumé that the best job opportunities prior to attending Clearwater Academy had been low-waged work. Low-waged work signals a lot of things to Clearwater Academy. Low-waged work often means "low-skilled work" (more on critiques of this term later). Based on a sample of participants' résumés, Black adult learners in this study worked as restaurant servers, daycare providers, club bouncers, sales associates, and cashiers. Other kinds of labor included activities that are better off the books, such as selling drugs. Illegal activities may become the only source of income when employment options dry up in their area. Richard recalled an automotive assembly plant shutting down in a town south of Sakowin. Many laid off workers didn't have the experience to work for the local school district, the second largest employer in the county, so some of them turned to illegal activities to access social mobility.

Low-skilled work also meant applicants never had the chance to study computer programming, because they didn't have the funds to pay for that kind of education or didn't know where to find those resources if they even existed in their schools or communities. Clearwater Academy would fill those gaps: provide resources for free so applicants could get legal access to social mobility. Clearwater Academy also attracted applicants from another sort of

working people: the degree-holding well-off type. Some of these applicants came from neighboring states. Why? "A lot of that is we're the only free opportunity [in the region]," Richard explained to me in July 2017. My interview with him and Jessica came on the heels of my first round of participant observation and interviews with the spring semester class. "We're the only opportunity that moves this fast, too. Most of these kinds of bootcamps are six, nine months. This is fourteen weeks." Richard and Jessica routinely rejected these out-of-state applications because they came from privilege, and they would most likely take their talent back to their home state. Clearwater Academy wanted low-income talent that would stay in Sakowin.

Yet Black adult learners' work history also suggested they didn't have the potential to meet the standards of the tech industry, or it would be a heavy lift to bring them up to those standards. After he joined Clearwater Academy as the new technical skills instructor in 2016, Richard had frank conversations with sponsors about how the program could improve. They told him, "There's no way these people get into these positions … after having gas station and retail being the best opportunity they ever had. They had bad habits. Social skills." Instructors before Richard had not prepared their adult learners for tech's workplace cultures, so they failed miserably on the job. The work ethic they knew (or didn't know) from prior work experiences wasn't going to cut it for these tech industry partners. Clearwater Academy graduates didn't just need to know something about computer programming; they needed to have been *transformed*. (Chapter 3 discusses in-depth the racial implications for transforming Black adult learners into valuable coders.) Low-waged work may be written-off, discounted, treated as unsophisticated and against a tech sponsor's interests. At the request of some tech sponsors, Clearwater Academy trained adults in employability skills and computer programming as a project that separates histories of low-waged work from their adult learners' next career. Only what's learned in those three and a half months should transfer to the next job, not the bad habit to go on smoke breaks every hour. Adult learners enter Clearwater Academy with little cultural and technological know-how for the tech industry. But by the time they leave, graduates' value as workers should have increased because "literacies produce value" (Watkins, 2015, p. 122).

In this chapter, I analyze six Black women adult learners' literacy work histories that tell a different perspective on low-waged work. These women spent their lives developing and using literacy for low-waged work in ways that was more meaningful than typically thought. Specifically, expect to read about how different jobs had underused their literacies and disrespected their lives as Black mothers. Their work was also often precarious: short-term positions or jobs with companies that were later bought out, merged, and downsized.

So these women moved from job to job less for social mobility and more so they could find an answer to a question: How do I take care of my family now? Yet in the background, and at times explicitly described, these Black women adult learners identified glimpses of empowerment through digital literacy. In some cases, training in computers recalled their curiosities and interests in digital technology from childhood; in others, they found their philosophy for education and their lived experiences as Black women affirmed. In short, they encountered different conditions and digital literacies in the labor market throughout their history. From their experiences, these Black women learn the kind of work ethic they expected and needed to leverage coding literacy into better life opportunities. Their literacy work histories tell a complicated relationship among race, gender, labor, and literacy that ultimately inform their decision to include Clearwater Academy in their literacy histories. While Black women navigating a racist and sexist labor market isn't new, what is new are the work ethics they draw from their history as they turn to Clearwater Academy for computer programming. In this chapter, past experiences with digital literacies across home, school, and, especially, work—even though these Black women adult learners did not engage with coding literacy—coalesce into new ways of describing what technology can be in their present and future. This Black coding discourse would, they hope, later lead to a Black tech ecosystem in which knowledge work's flexibility would reward them meaningful contributions to technology design and, ultimately, access to family and community.

A nation-wide cultural bias in the United States toward low-waged work hides these dynamics. "Low-skilled work" suggests personal failure of the worker: that they were too lazy to do better, compared to the often more valued high-waged, often college educated so-called "knowledge work." The reality, however, suggests that "American labor standards, racism and sexism, and social and educational infrastructure" drives millions of Americans into this work (Lowrey, 2021). Low-wage work feels and looks easy and is disposable or replaceable with automated technology. The COVID-19 pandemic, for example, revealed the federal government's mixed messages about the value of low-waged workers. The Cybersecurity and Infrastructure Security Agency's (CISA) Essential Critical Infrastructure Workers "identifies workers who conduct a range of operations and services that are essential to continued critical infrastructure viability, including staffing operations centers, maintaining and repairing critical infrastructure, operating call centers, working construction, and performing management functions, among others" (Krebs, 2020, p. 1). People who could work from home during lockdown, or who simply lived at home because they had lost their job to the pandemic, relied on these low-waged workers to keep their lives going as normal as possible.

Despite their value to the economy, low-waged workers were not given necessary protections against COVID-19 to ensure they could even support critical infrastructure (Wolfe et al., 2021).

As some version of normal life emerged in 2021, office workers debated with employers about returning to their desks and other workspaces in-person. Many had gotten used to remote work and saw little reason to start commuting again. After signing an executive order to end fines imposed on small businesses in New York City in January 2022, Mayor Eric Adams added his two cents on the debate to journalists: "Many employees are saying, 'We don't want to come back into the office …' Now, that's fine, if we weren't connected. My low skill workers—my cooks, my dishwashers, my messengers, my shoeshine people, those who work in Dunkin Donuts—*they don't have the academic skills to sit in a corner office*. They need this. We are in this together" (Hess, 2022, emphasis mine). Those same cooks and dishwashers criticized Mayor Adams for associating intelligence and education with office work and for suggesting so-called uneducated people could only get blue collar work. The incident with Mayor Adams reflects competing perspectives of low-waged work: it has immense value but doesn't; they are an example of taking off the comforts of home for economic productivity that office workers should follow, yet their education limits them from reaching the full potential that knowledge workers have.

Controlling images of Black women's social position in the United States create intersectional oppressions that exacerbate cultural biases against low-waged work. Controlling images are false archetypes of Black women, or a set of social expectations and standards held by both Black men and white people. The mammy, the matriarch, and the welfare mother, for example, suggest Black women must be either all-powerful, all-desperate, or all helpless; Black women, as Patricia Hill Collins (2009) writes, are often socially constructed as serving the engines of the patriarchy and white supremacy, not for themselves, for their families, or for each other. In West Africa, women tied work and family together as equal sources of nourishment. However, slavery forced Black mothers to labor for white families instead of their own and stripped Black women's control over their work conditions and reproductive rights. Their children became property by proxy and helped increase plantations' enslaved labor. After the Emancipation Proclamation, Black families could not live off the wages of Black fathers alone, necessitating that Black mothers work in either one of two locations that paid low wages: the fields of white families or the homes of white families. Even so, single, divorced, or widowed Black women participated in the labor market more than married Black women, and especially, white married women, in the 1870s and 1880s (Goldin, 1977). By law, single Black women could not rent land in the late 19th

century, so many of these single women migrated to urban cities. In the North and Midwest Black women found day work, yet awful relationships between Black women and their employers persisted. White men sexually harassed Black women one second and then turned around in another second to use them as submissive confidants that would listen to their displeasures about their wives, children, and other family members.

In the 21st century, single Black women continue these legacies of race, gender, and class oppression: most Black women in the United States work low-wage service jobs, and although most Black women are the sole breadwinners in their household, they make significantly less money than white women (Frye, 2023). These logics of American Black women labor operate on a global scale in infrastructures for digital communication. Safiya Noble notes that Silicon Valley's success relies on the low-wage work of the Black diaspora. These companies outsource mining cobalt, the essential mineral for computer hardware, to Congo, where wars over the valuable materials for profit persist. Neither Silicon Valley nor its loyal customers give much attention to the fact that their technologies are built with the blood of "artisanal miners" (Kara, 2023), a clean name that tries to make invisible Black people's strenuous and dangerous work (Noble, 2016). Living in intense poverty and under patriarchy, women (and even children) often work in the cobalt mines to support their families, earning one to three dollars per day (Sovacool, 2021). According to one estimate, twenty percent, or 400,000 workers, are women. And their status as women forces them to take low-waged work, from collecting the materials to, more often, cleaning and sorting the minerals. Working in these unregulated mines, attract systems of sexual exploitation and abuse (Sovacool, 2021).

However, Black women have an ongoing legacy of turning knowledge of and experience with oppression into action, carework, and survival, which they express through multiple literacies, from literature (Fisher, 2007) and hip hop (Craig & Kynard, 2017; Richardson, 2021) to theatre (Winn, 2011). Despite Black code laws that restricted enslaved Black people from learning reading and writing, Black women developed their own version of rhetorical education and rhetorical activism throughout the 19th century (Royster, 2000). In our digitally networked world, fighting for liberation in digital spaces is a type of labor itself (Jones, 2019; Russell, 2020). In the early 2000s Black women used social media platforms such as blogs, Black Planet, and X (formerly called Twitter) for liberating discourses. However, in the late 2000s and onward, mainstream media's attention turned Digital Black Feminism into a commodity, a product, a profitable spectacle, especially for social media platform's ad revenue. Black women have found ways to turn both their individual cultural brand and Black feminist thought into profit. Despite that success, they must be considerate

of how corporations still siphon money off digital Black feminists' labor and how users can fail to interrogate and use Black feminist thought for deeper critical analysis. As Catherine Knight Steele (2021) writes, "Selling Black feminism raises concerns about whether Black feminists can sustain their relationship with capitalism and profitability online while pushing for systemic change. However, it also reminds us that Black feminists are already managing to do so" (p. 139). Black women entering STEM, and computer science more specifically, must wrestle with how systems of oppression call them into being exploited further and into being unwitting participants in designing or supporting digital technologies that exploit their own people.

My argument in this chapter joins other scholars in literacy studies that correct dehumanizing views and practices of low-waged work literacies. Among others (Hull, 1999; Marotta, 2019), educator Mike Rose's work helps me identify the empowering meanings Black women in this study attach to labor throughout their literacy work histories. Rose (2004) observes that we often think blue collar jobs require physical work alone—the body and the hand get things done. The testimonies he collects from his mother and other people working across different occupations—from restaurant server to electrician to welder—show how these jobs involve complex cognitive work. Rose goes a step further by describing a surgeon's manual labor on an operating table. Rose breaks the blue collar/white collar binary "to correct a deficit-oriented perception of entire occupational categories and, hand in glove, to appreciate the degree to which powerful techniques and strategies of mind and body are manifest in a wide sweep of work." Thinking that these two types of jobs require different physical and cognitive abilities keep us from perceiving "commonalities in the way different kinds of work actually get done at the level of immediate, day-to-day practice" (Rose, 2004, pp. 148–149). While representation matters for recruiting Black women into STEM, representation will not save us. Understanding the whole self includes understanding one's own literacy work history in relation to new opportunities. Low-waged work has been used to keep Black women down; now computer code bootcamps wish to help them escape that labor. That history of low-waged work cannot be separated from computer programming; it is literacy work history with low-waged work that can help us reconstruct what the so-called pipeline into computer programming involves. This chapter addresses tech sponsors' construction of Black labor as low-waged work as experiences that do not mesh well with their professional standards. I draw tighter links between the Black adult learners' literacy work history practices and the coding literacy they profess to learn from Clearwater Academy in this chapter.

I argue that low-waged, contingent, and often gendered work has taught Black women first-hand the kinds of relationships they need with labor and

literacy to upgrade their lives. Low-waged literacy work gives Black women opportunities to survive and do carework, but it does not allow them to obtain the promises and opportunities of literacy to help them thrive more fully as Black women. They develop a set of work values that labor markets must follow: flexibility, more time with family, and more chances to be resources in their own communities. These desires from literacy work practices gives them full access to their minds, bodies, and spirits. Rather than understanding their "best opportunities" as divorced or having nothing to do with tech, these Black women find Clearwater Academy a useful and relevant bridge—not a conclusion—over into a different relationship with labor, one in which they are not exploited and abused, one that may allow them to respect their lived experience as an important addition to literacy work. They uphold Clearwater Academy and coding literacy to a high standard for their return on investment.

In this chapter, I show that literacy work history reveals the ways Black women construct their work ethic with labor and the economy to humanizing ends rather than what serves technocapitalism. The Black women's knowledge and experience in this chapter further exemplify Black feminist thought's intellectual contributions to empowering Black women against intersectional oppression while re-envisioning what counts as knowledge (Collins, 2009), but in the context of computer code bootcamps and the tech industry. The chapter then responds to ongoing calls that everyone should intentionally listen to Black women (Mckoy, 2021) in the tech sector (O'Neil, 2023). They provide antenarratives that could change the trajectory of technocapitalism. Their Black coding Discourse about work and digital literacy demonstrate what values drives Black people's laboring with computer programming practices for community and family.

I also argue for a methodological contribution to workplace literacy and computer science. My documenting Black women's literacy work history in this chapter came by accident. Between spring and fall 2017, I spoke with all 12 participants about their *literacy history*, an interview method that captures direct accounts of how literacy "courses through people's experiences, acting in concert with historical trends" (Vieira, 2016, p. 138). Literacy studies scholar Deborah Brandt made this method popular with her book *Literacy in American Lives* (2001). Literacy history interviews have been significant for understanding how literacy practices develop in marginalized communities in response to the shifting tides of the macro-level economy, racist policies and laws and civil rights, and personal encounters with literacy ancestors (Lachuk, 2016; Miller, 2016; Pritchard, 2014, 2017; Vieira, 2010). In 2020, I reported on the literacy histories of four Black men who attended Clearwater Academy during spring 2017 (Byrd, 2020). They often associated learning

digital literacy in school with racism while remembering tinkering with computers more fondly; this part of the larger study articulated how so-called resource-poor communities have rich digital literacy practices that complement coding literacy. However, the six Black women's literacy histories had no such significant associations: a couple incidents here and there, but nothing that could justify a thorough accounting of their schooling. And then, four years later, I revisited those women's literacy histories and found nestled within their stories detailed accounts of the kinds of jobs they had, the circumstances that led them to those jobs, the workplace conditions they navigated, and the impact the work had on their family life. I call these accounts *literacy work histories*.

In this chapter, "literacy work" means the literacies people possess to show their worth in direct tension with conventional, often white and patriarchal centered views of who is a valuable worker. I don't use the more well-known term "workplace literacy" because that narrows literacy practices to your profession or career. Literacy work helps me understand that any literacy practices a person has at any point in time in any situation can be chosen as valuable forms of human capital (Watkins, 2015). "Literacy work history" details the many ways literacy practices have been deployed for human capital over time according to the shifting tides of work ethic across multiple points of labor.

Unlike literacy history interviews, literacy work history interviews explore how Black people's literacies get purposed and repurposed in the economy and how Black people then construct meanings about labor in response to these changes over their lifetime. Incidents that happen in the workplace – across many professions and/or positions -- reflect sociocultural values of how literacy should be used in the economy. These values also reveal how gender, labor, and race interact. These incidents lead Black women in this chapter to assert their agency over their working lives, inevitably changing the trajectory of their literacy lives in the process. A literacy work history interview digs deeper than what any résumé or cover letter can describe about those same people; their stories in these interviews describe motivations and feelings about literacy and labor that guide their twists and turns from one position to the next and what they desire as Black women. Literacy work histories answers how Black women construct work in the United States and how that construction folds into expectations of laboring in the tech industry.

Because the six Black women I interviewed shared their literacy work history while talking about their longer literacy history, I had no protocol for asking about these lived experiences, no plan to go as deep as they had gone. Semi-structured interviews lend themselves to flexible conversations. While I may go into a study with a set of questions and topics I would like to ask, I let the participant take their stories in whatever direction they wish, as it's in the

confines of our topic. Listening and empathy, I think, matters in interviews, so when participants describe stories of vulnerability and heart break, I must lean in closer and not interrupt what I think is a side story to my intent and purpose. Some participants' literacy work histories are more detailed than others, but I find meaningful threads about family life, literacy, and labor that reasonably link together. Literacy work histories extend back to these Black women's childhood experiences with learning how to read and write and back to their digital literacy instruction in their homes and in their schools.

In the following sections, I describe how and why conditions of work and different kinds of jobs changed throughout Black women's literacy work histories. Race and gender oppression over time culminates in their developing a work ethic for professional life that they expect tech to fulfill. I first explore the work ethic Black women learned from three different sites of training: school, home, and their own exploration of computers in different situations. I show how Black women lost significant gains in their literacy practices in high school. Several life choices pushed these Black women off track from the grand narrative for American education. Contingent, precarious, and gendered work reached up and caught them for survival. These jobs taught participants that their work was worthy of reward even though employers and colleagues disrespected their literacy work practices and their very existence. Work conditions took advantage of their talents and frustrated their well-being and family life. Still, these Black women produced dynamic literacy work practices out of these difficult conditions. At work and school, they are close yet far away from digital literacies as they make choices in response to those changing conditions. Then I discuss how Clearwater Academy should, for these women, be an answer to their literacy work history in two ways: first, they make a bridge between their literacy work history and Clearwater Academy; second, Clearwater Academy itself is meant to be a bridge to flexible literacy work, leaving time for family and community. Tech isn't a conclusion but a steppingstone to more personal goals for life and labor in these Black women's lives.

Work Ethics Across Home, School, and Private Playgrounds

Although I describe and analyze six Black women's literacy work histories, I begin with their childhoods across three different locations: home, school, and what I call their private playgrounds where self-directed study of literacy happened. Our literacy work practices develop long before we are eligible for employment at the minimum age of 14 in the United States. Evan Watkins' observations about literacy, education, and work inform my thinking here. Watkins (2015) argues that people aren't just a bundle of literacy uses

and experiences; they are potential assets for the economy. Schools do not shepherd us toward democracy or other literacy myths; schools have been "conscripted instead into the making of literacy subjects" (Watkins, 2015, p. 30). I would argue that households and the private playgrounds we create for ourselves set us up for conscription into economic productivity. Turning all parts of Black life into contributions for the economy was the leading logic for Black women's enslavement in the United States, a history I summarized earlier. Unlike the 19th century, recruiting all parts of Black life into capitalism for white supremacy feels more subtle in the 21st century. I show that Black women in Clearwater Academy had little experience with computer programming in childhood. But their interactions with digital literacy taught them desires for meaningful engagement with literacy work that gives personal fulfillment. To achieve this goal, I describe how Black women participants came from households and communities rich with literacy practices. Engaging with literacy across home, school, and private playgrounds taught them a set of values about literacy that they can translate into work.

Receding into the Shadows: Present/Absent Adult Families

Parents and guardians taught their children literacy early in their childhood but often later left them to read and write independently. Yet their families' approaches to parenting and teaching would still linger and influence some participants' literate lives. Myra, a thirty-four-year-old certified nursing assistant and single mother to a seven-year-old, was the oldest of six brothers and sisters. Her literacy work history interview stands out because when she answered my questions about her childhood, Myra would often say "we" to mean herself and her siblings. It was as if her childhood literacy learning was a communal experience, and Myra was the designated archive of her siblings' literacy histories. Many family members played a significant role in Myra's learning in community with her brothers and sisters. They were the children of a stay-at-home mom who made them practice multiplication tables from their older cousin's math textbook; their aunt would turn the volume off on the television and make them read the captions, much to Myra and her siblings' annoyance. Their grandmother instructed them to write their names over and over to practice good penmanship. Out of these family members, Myra remembered her grandmother describing the consequences of literacy for their lives. "Don't nobody like anyone with bad penmanship but doctors," Myra recalled. "If you gonna be a doctor, I'll accept [that]. But until then you gonna write perfectly in the lines." Practicing penmanship wasn't just about penmanship; Myra's grandmother taught penmanship to teach that their literacy reflected her and her siblings' reputation and that they needed discipline

to succeed in life. These lessons would follow Myra well into her adulthood. Here's a brief exchange between myself and Myra after she had finished the penmanship story:

> **Myra:** And to this day I write directly on the line.
>
> **Antonio:** Really?
>
> **Myra:** I do not write outside the lines; I freakout.
>
> **Antonio:** Because you've been drilled.
>
> **Myra:** I've been taught that. And I've always been told that your name is all you have. So respect it. Yep. That's my family. It wasn't bad; it was discipline.

Myra and her siblings also picked up learning through repetition from adult family members. When they helped their grandmother cook in the kitchen, Myra and her siblings read to her the correct measurements from recipe books. "And if she ask you something you better re-read it," Myra recalled. "You know it, she told you fifteen times. That's why my memory is so fresh. I remember shit. But people don't remember." That learning by repetition blossomed when Myra and her siblings were left to teach themselves. In fact, other than the few memories she recounted, Myra remembers teaching herself how to read or her siblings teaching each other the most. Her older brother would take on the mantle of learning through repetition. Each day after school, Myra's brother gathered everyone to read and then recite the Shephard's Prayer (*Contemporary English Version*, 1998, Psalm 23). To help with memory, Myra's brother made everyone write the Prayer "a hundred times." The Holy Bible has many memorable verses but Myra's brother thought the Shephard's Prayer was the one to know if they remembered nothing else. Emphasis on learning through repetition turned out to be a valuable literacy work practice in adulthood for Myra. As a bartender, she could sling drinks quite easily for customers: there were few cocktails she didn't know, and her manager was amazed telling her, "You fast, you quick. You remember shit."

The *absence* of adult family members can have as much influence as their presence. Zelda, a twenty-six-year-old unemployed single mother, recalled growing up with a hands-off mother. She was disappointed that her mother never encouraged, or forced, her older brother to pursue a bachelor's degree in computer science from Cornell University. He had not even applied to the prestigious college. Instead, the university *invited* him to attend. But Zelda's brother wanted to attend college in Japan. Their mother let him decide for himself what he wanted to do with his life. After the university in Japan rejected his application, Zelda's brother swore off college completely. Zelda took notes from

her mother on how *not* to raise a child. "Parents are supposed to push you forward," Zelda said during our literacy history interview. "Parents are supposed to guide you. But that's not what's happenin' to my daughter. Forget that." Yet Zelda's family believed in natural talent for learning on one's own. She recalled her parents buying a home computer for the household, but then did little more than teach Zelda and her siblings the basics and then just walked away. "They showed you once," Zelda remembered. "They showed you how to access something. Showed you how to do something. They only showed you once. If you didn't get it the first time, it's not meant for you." The advice suggested that learning came naturally, or that a concept was so thoroughly taught once, it need not be taught again. If you don't get it, the fault belongs to you, and you should quit. This advice resonated throughout Zelda's life well into high school and in learning computer programming at Clearwater Academy, as well. Zelda believed she shouldn't have to study coding often; if she had to study often, computer programming probably wasn't meant for her to learn.

In this first part of the section, I'm establishing the lingering impact of absent adult family members in the literacy learning of these participants; what presence they did have helped them establish important philosophies for how Black women should orient their minds toward discovering the world as learners: literacy as a collective experience; literacy as an access point to emotional and intellectual growth; literacy as a tool for Black feminist agency. These beliefs would develop into a work ethic for learning and using literacy work practices. Other than instances like these across their lives, adult family members mostly receded into the shadows as participants got older. For example, Alice was raised by a single mother who had to work all day to provide for her children, so she wasn't around much to assist in her learning; Halima, a Sudanese refugee who came to the United States at age five, grew up in a two-parent household but neither her mother nor father knew English well. Her mother wouldn't learn English until a decade after arriving in the United States. In their absence, families tended to create home environments that encouraged self-directed literacy learning or exploration of digital literacy with others. Adult family members purchased the materials and spaces needed for their education, such as books, computers, and internet access, and then they left their children to learn reading and writing from those materials, from schools, and then, unknown to these parents and guardians, from the private spaces their Black daughters and granddaughters created for themselves.

You're on Your Own Now: Conflict and Agency

When left to their own devices, Black women adult learners attending Clearwater Academy extended values of literacy learned from present and absent

adult family members. In their private playgrounds as children and teenagers, the Black women adult learners practiced and developed new kinds of literacy work. But they also reported conflict between the literacy work practices they explored privately and what they were taught in school. Educational institutions, as asset-building training grounds for the economy, possessed more power over defining what literacy work practices would be available to Black women after graduating from high school. In this section, I show the circumstances that led these Black women adult learners to create private playgrounds, and the conflicts and influences school had on their beliefs about literacy work practices.

Rania was one of two Black women in this study born before the Civil Rights Act of 1964 and the Voting Rights Act of 1965. She was born and raised in the Midwest but traced her family roots back to the Deep South. Recounting her literacy history at age 55 in 2017, Rania developed her private playground of literacy learning in response to domestic abuse. She didn't remember much reading in her household, but she remembered writing. A lot. Every time her father got mad or abused her mother, Rania turned to paper and pencil for comfort. "I used to write, write, write, write," she explained to me. "That's all I did. Just write. Just copy stuff. I really wasn't reading. I was pretty much just writing, doodling. Writing everything I saw." She did recall not hearing her father encourage reading books. Instead, he used literacy to isolate Rania from him: "The only time he said go read book is when he got mad at you and wanted you to get out of his face or something."

Rania took advantage of that isolation when she was twelve or thirteen and wrote poetry and fiction to process her feelings about the abuse. She wrote on any paper she could get her hands on, including mailing envelopes. In high school, Rania worked to help her mother and father with bills, but she kept a little for herself to eventually buy a Brother typewriter. She moved from writing on paper to writing poetry with mechanical ink. In her private moments with literacy away from parents or teachers, Rania began to think that maybe creative writing could be her career, that words could be her trade. She thought she was pretty good at creative writing, after all. But school—another space of learning literacy work practices—ruined her dreams. Teachers thought this kind of literacy work wasn't suitable for Rania. She recalled that "one of my teachers had told me I wasn't good enough. And I never pursued anything. Talking about the way I talked. Talking about talking country. They didn't understand you might talk a little different because your parents grew up in the South. You in the inner city. So of course my language—I didn't grow up around white people, so my language is not gonna reflect that." Between that discouragement and growing up in an abusive household, Rania felt less confident in her literacy practices, that "you always feel like you weren't good

enough." These feelings followed Rania through her literacy work history and her sporadic college education. Yet she would never let go of creative writing and drawing: over the course of her life, Rania still maintained disciplined interest in these literacies, turning personal interests into dreams of a professional life. At Clearwater Academy, Raina wanted to write and draw an illustrated book that taught children about domestic abuse. I detail later how these literacies sat on the margins while she had to jump from low-waged job to low-waged job before coming to Clearwater Academy.

The private playground Rania created for herself is different from Alice, Zelda, Myra, and Halima. These four Black women are the children of the late 1980s and early 1990s. They grew up when the internet became widely available in households in the United States. Scholars and journalists have already documented how invaluable the internet was to Black people during the late 20th century (Banks, 2006). Early versions of social media platforms like Black Planet and Myspace in that history also appear in Alice, Zelda, Myra, and Halima's stories. What they describe in their literacy histories, then, will look familiar but in the context of literacy work history, they show a work ethic for digital literacy not accounted for in their public schooling. Because this Millennial generation had similar circumstances with one another, I'll focus on Halima and Zelda's private playgrounds for digital literacy learning and the kinds of work ethics they developed from self-directed study.

Halima created her own private playground for digital literacy learning thanks to two circumstances of her family environment: her parents' digital literacies and her place of birth. Halima's father lived a lavish life in Sudan. He owned a successful restaurant, a very big house, and had several mistresses. He hired maids and nannies to take care of his family, and he traveled a lot. But then the Second Sudanese Civil War broke out in 1983, and Halima's father lost all his money a few years later; he still owned the restaurant, but he couldn't do anything with it. His social status diminished. A refugee living in the Upper Midwest, Halima's father bought a computer for the household. In the United States in the 1990s, computers and the internet meant you had power, and Halima's father wanted to reclaim some of the power he had lost in Sudan. The computer was a status symbol for her father, not a practical tool. In the off chance her parents wanted to use the computer Halima had to help them navigate the interface and type for them. As for Halima's six siblings, they had no interest in using the computer either; she was the middle child, so her brothers were too young to bother with computers and her older sisters had other interests. As far Halima was concerned, the family computer belonged to her.

With family occupied with other concerns or interests, the computer and the internet guided Halima's digital literacy learning in the fifth and sixth

grades. When her family first got a monthly subscription to America Online (AOL), Halima taught herself how to get on the internet. "I'm more of a learn how to, ya know, adapt … I'm somebody that adapts to things," Halima explained. "Of course, I might not know how to use it, but I figured it out some kind of way." Halima eventually accessed AOL Instant Messenger chatrooms and met strangers who knew HTML and CSS. When she saw their custom websites, Halima wanted to learn more. "So they were actually sharing little HTML scripts, like code, to put on to your own page, and make it do this and make it have flowers and all that," recalled Halima. "It took me like a month or two to build my own website."

Despite the excitement of creating her own websites, Halima pursued other interests in middle and high school, such as drawing and the cello. She insisted on writing for the middle school newspaper to expand her English. There was no special treatment or support for the English language learner. Teachers "gave me the same assignments as everyone else. And I was expected to live up to the standards as everyone else. And I did." She would continue this kind of labor into high school, too, writing "simple stuff" like movie and theatre review articles and announcements about upcoming athletic events. She never considered herself a good writer or a sufficient English speaker, but Halima pursued writing, and other extracurricular work, because she was "trying to see what I could do."

As a Sudanese refugee in the United States, stuck between the prejudice of white people and misunderstandings of Black Americans, Halima certainly had a different perspective on education in her new home country: "People don't realize the opportunities that they have here in the United States," Halima explained. "And I guess I try to take advantage of that. Writing and taking fencing, orchestra." In childhood, Halima always complied with the expectations of superiors, whether that's other coders showing her how to learn website design or following the standards for effective newspaper writing. In her private playground, Halima appreciated the opportunity to explore what's possible. Her time with the computer would be a forgotten memory until well into her adulthood at age 32, when the work ethics of digital literacy would come rushing to her again at Clearwater Academy.

Zelda's father was a well-off electrician interested in learning new technologies. He started his own company in the 1990s and made enough money to own a building across the street from his house where he could work. Her mother was an accountant and had an office in the building. When the internet and first computer came out, Zelda's father jumped on the opportunity, buying computers for the office and a computer for the house. Zelda's parents spent their days across the street working, leaving Zelda and her siblings to do what they wanted on the home computer. Even when her parents came

home, "they barely used that. They had their own computer in their office … That was our computer." Other than showing them how to learn something once, as mentioned above, her parents had little to do with Zelda's digital literacy learning. The physical distance of her parents, their sociocultural value of learning, and the proximity of the computer all contributed to Zelda commandeering the computer for herself.

Zelda picked up web design and what I call social manipulation from her self-directed study of computers. She remembered her first computer was an IBM and she and her siblings played a lot of games, like *Minesweeper*, *Frogger*, and *The Oregon Trail*. By age eleven, Zelda was on Myspace. The moment was inspirational because she could design dynamic webpages. Her personal page was "poppin'! I had my own background; I had it custom! Had the music playing!" Her Black friends, however, wondered why Zelda wasn't on Black Planet instead. Zelda's cousin was "better with computers" and showed her how to use the social networking platform designed for Black users. Zelda also learned catfishing from her cousin—the social manipulation, I mention at the start of this paragraph. She remembered she had gotten Black Planet at age 13 because around that time she started manipulating a boy on the website. The motivation had less to do with her own self-esteem: "I wasn't ugly," Zelda clarified. "I just wanted to be this older person who's like—I don't know. Perfect. I didn't know that was catfishing at the time though. I was thinking, 'If I really want a guy who I like to talk to on Black Planet why not I just pretend I'm his dream girl or something?' Or whatever." Zelda used her invented persona to attract this boy who lived in Chicago. After two months pretending to be his dream girl, Zelda confessed who she really was. He took the news well, and they started a long-distance friendship that was still going strong 14 years later when I interviewed Zelda.

Leveraging digital literacy learning for socializing was Zelda's most valued literacy practice. Zelda designed and edited photos in her spare time when Facebook became available to non-college student users in 2006. Zelda joined the site immediately but was let down by its restrictive design. She said that "Facebook is stupid; they don't let you customize anything." Yet she relied on Facebook heavily to plan hangouts with friends, after Zelda's father took her phone away. She was the first of her friend group to get a Verizon flip phone when she was sixteen years old. It had a rotating camera and she remembered listening to Kanye West's 2004 *College Dropout* on it. A lot. Somehow putting that album on repeat every night for several hours racked up a five-hundred-dollar phone bill. "When I lost my phone, I used social media a lot," Zelda recalled. "Because I didn't have anything else to do. I was bored." They all enjoyed smoking weed, so "even if we didn't have cellphones and stuff, we'd hit each other up on social media. 'Hey, you gonna meet me here. You gonna

come over? Dadada …' I invited those motherfuckers over to my house." Social media, Zelda thought, was her favorite part about computers. In a world where any literacy practice can be an asset for the economy, Zelda used social media as a work ethic: appeal to people whether near or far to convince them to take a deal: hangout and smoke weed. Have fun. Facebook profited off her socializing, but Zelda benefitted as well, later transforming those experiences in her private playground into a career in digital marketing.

Unlike these Black women's private playgrounds, schools had the least imaginative ways of using digital literacy. While Rania and Rosie grew up with trace paper, pencils, and typewriters before they used computers on the job, the Millennial Black women could only remember typing in school. Other than Alice who enjoyed typing, even writing book reports for her older brother, most participants found typing a dull experience that added little value to their digital literacies. Zelda never did her homework: one reason was that she comprehended and learned concepts from class, a call back to her family's belief that if you don't understand something the first time, it's not for you. Homework was for anyone who didn't get the lesson the first time around. Zelda refused to do any homework that required typing because she didn't see much value in the skill. In her freshmen year, Zelda's high school offered a computer class that taught typing, but she questioned why anyone would *want* to learn to type fast. In high school Zelda spent more time creating PowerPoint presentations, but she preferred to write on paper because it kept her present and close to her ideas. She would have someone else type out the work. This practice Zelda took with her during a short stint in college right after high school graduation. Social media. Designing on Myspace and Black Planet. Playing with Photoshop. These digital literacies had real value to Zelda, not the constant typing of words that her teachers emphasized. Even paper had more value for its material feel and the way it challenged her mind to remember the content she wrote.

Myra experienced the same typing lessons from elementary school to high school and hated it a lot. She didn't appreciate that her high school teacher argued that typing was the preferred work for women. At first, Myra remembered that he wasn't explicit about this work ethic for women; she could tell from how he "treated the girls and treated the guys" in class. But immediately after mentioning this detail, Myra recalled a specific moment when her computer teacher was more explicit: "Because I have to think about it. When I first started learning computers in class, that was in the 90s. And we had a computer teacher who was like, 'Women are supposed to type.' … Yeah, that's what their jobs was. Secretaries, administrative assistants." Her teacher's argument that typing is women's work echoes in the work experiences of other Black women in this study, across generations. It's reflective of class, too:

Black women qualified for temporary or relatively low-income jobs. This perspective links literacy work in school with actual work for these Black women; granted, other life circumstances shaped what literacy work was available to them. Myra noted the irony of the coursework in high school. While the computer class teacher taught only typing, her English teacher—a Black man from Philadelphia with a background in computer science—taught her the ends and outs of how computers worked, from software to taking apart the hardware. However, the teacher did not teach computer programming; Myra encountered that while designing her Myspace page.

I suggest work ethics about digital literacy begins in childhood from home, school, and their own private literacy playgrounds; if we are all potential assets in a capitalist world, Black women in this study learned early the value of work and the discipline necessary to do well. What comes out of their collective experience is learning and exploring literacy for personal fulfillment, curiosity, and connections with others. This kind of work ethic pushes against narrower yet powerful conceptions of digital literacy in schools. Teachers confine human expression to typing, packaging words into different forms—Word, PowerPoint, Excel—and offer little to no opportunities for using computer programming for human expression. In addition, the specter of administrative work as suitable labor for Black women perpetuated that narrow believe of what work these women could do. Coding is for boys and men. However, the relationship between school and private playgrounds reveal the rich knowledge Black women bring about literacy and work, knowledge they bring to Clearwater Academy as a bridge into opportunities they desire. The "best opportunities" have significant traces for shaping philosophies on "working while Black." Humanizing practices with digital literacies continue to echo for these Black women as they take these experiences with computers into the racial and gendered conditions of work.

Never Finishing Literacy Practice, but Always Coming Back

The grand narrative of opportunity in the United States tells Americans that they can leverage education as a pathway to success. Children attend school through twelfth grade and earn a high school diploma. Then, as newly minted adults, they go to a good college. With a college degree in hand, they compete for and eventually win a good paying job. Their salary and benefits help them start a family, own a home, and plan for retirement. The realities of intersectional oppression and matrix of domination undercut this story of success. While intersectionality explains how oppressions can intersect across identities at the same time (race and gender, for example) (Crenshaw, 1991),

matrix of domination suggests that this oppression organizes power in society (Collins, 2009). The grand narrative of opportunity tends to work most often for white, straight, able-bodied Christian men possessing a particular kind of social and cultural capital associated with middle class, or higher, status. Black women's literacy work histories exemplify how organized principles of racism and sexism influence their labor with digital literacies. While participants were on track following this grand narrative early in their lives, they faltered and dropped off the path as they approached high school graduation; circumstances both within their control and the result of racism turned some Black women at Clearwater Academy into perpetual returning adult learners. In this section, I address participants' efforts to acquire quality education for quality literacy work. It sets up the consequences for falling off track: finding contingent, low-waged work. On the flip side, these six Black women's lived experiences create a foundational philosophy that leads them to attend Clearwater Academy and accept computer programming as key tool toward fulfilling their work ethics.

The Black women participating in this study recount multiple ways of being a returning adult learner—someone who leaves educational institutions but try to get back into the classroom later in life. The circumstances for leaving high school or college varies, some personal choices and others due to circumstances beyond their control. Whether the mistake of an academic counselor or for a different unknown reason, Zelda had missed taking a required history course in the ninth grade; she needed to complete the class as a junior. Zelda's parents were divorced by this time, but she didn't live with either one of them. So the school required that Zelda have all teachers write and sign a report to prove she was attending class. Her ninth-grade history teacher was a white woman in her first-year teaching. One day Zelda and the history teacher got into it. "She was literally writing like—all she had to do was sign it and write a couple words," Zelda said. "She was writing a story. Like 'She was not paying attention in class all class. She was doing other class homework and dadadada' which … Okay. If she would've wrote it quicker, it would've been great." But Zelda had to turn in a paper before racing to catch the bus home. Annoyed, Zelda tried to snatch the paper, and the teacher slapped her hand down on the report. Zelda lifted the teacher's hand up, took the paper, and walked away. "Because I was tired of her treating me like—she treated me like I failed ninth grade history, and I didn't. I just never took it. I took literally every other history class. I took history for seniors, but ninth grade history is a requirement to graduate high school. So she treated me like I was this dumbass kid who failed it." But after Zelda snatched the report away and left, the teacher had permission to do more to make Zelda's life miserable: she reported Zelda to the principal and claimed that she had pushed her. The

school expelled Zelda for a year. When she returned, Zelda took her High School Diploma Equivalency (HSDE) and graduated early.

Reflecting on the teacher's motivation, Zelda suspected that racial bias played a significant role in the incident. "She felt intimidated or something," she explained. "She probably already thought one thing. Like 'Oh this Black kid is taking this class because they're bad and dadadada and blah blah blah.' It's like, dude, I have a 3.8 GPA. Are you fucking kidding me right now? It was bullshit. I was so mad. I'm still mad to this day." Zelda had done everything right in school; she went above and beyond the expectations of school-based literacy learning but encountered suspected racism, which slowed down Zelda's own journey of achieving self-actualization, her full creative and spiritual potential (hooks, 1994). Her experience and my own analysis support prior research in Black Girlhood Studies and literacy studies that consistently shows how school administrators and teachers unduly punish Black girls to control their behaviors and femininity (Carter Andrews et al., 2019). Schools continue what the slave institutions established for enslaved Black women: Zelda arrives on campus with rich literacy practices and a determined sense of self, only for schools to deny these essential resources for her well-being in school.

Myra and Alice also fell off track in high school, but they both went on to try college after graduating. Alice took night classes to catch up on missing high school credits and get her HSDE. Myra said she fell behind and dropped out of high school after her grandmother passed away, but, like other participants, returned to finish her diploma with no pomp and circumstance march. Higher education was a different kind of challenge for them both. Alice spent just one semester at a community college: "I ended up withdrawing due to, like, first of all, I think I overloaded myself," Alice recalled. "And, secondly, I wasn't taking it really seriously as I should have. I ended up just withdrawing from that semester of class. Like I finished the first semester, but I ended up withdrawing for second semester." Myra majored in social work and psychology. She did a year but then "fell behind" and admitted that she wasn't "focusing" on college. Myra went on to low-waged work to support her little daughter, but she had dreams of going back and trying again. After graduating from Clearwater Academy in Fall 2017, Myra had planned to start the new year fresh with a return to community college. She just needed to "get my appeal letter together, because I flunked a class, so I gotta get my appeal letter together, but I'm gonna go back and finish it." Meanwhile, Alice would try another route to stay connected to college. Sakowin University had started an adult education program called Journey. For one academic year, low-income working adults could take humanities night classes. If they finished, adult learners would get college credit that could transfer towards a degree in the

university. The opportunity to go back to college after failing so much was, as she wrote in an application for a grant that would cover some living expenses while attending Clearwater Academy, "revolutionary." Alice went on to write:

> Ever since I was told my application to the program was accepted, I have felt nothing but encouragement. Each time I say that sentence aloud (or in my head) I fight back tears because it has tremendous value to me. Just the thought of two highly intelligent and university educated individuals [teachers responsible for admissions] who believe that I am "college worthy" was all I needed to set out on my very own [journey] to education. … I dared to dream (again) that I could become a first-generation college student.

Finishing college was a priority for fifty-eight-year-old Rosie, as well. She dropped out of high school to work and support her family. She called that part of her life "a little detour" before returning to high school for her General Educational Development (GED). While she worked as an office clerk, Rosie took college courses in information technology (IT) off and on at the same community college that Alice and Myra would attend years later. The classes taught her the "A to Z about computers. How to repair them. To do tech support type things. Say if I were in a call center someone needed help with a … How to make this work, or that work. We learned how to go through the scripts and the software packages that they had available. Go through that piece." Rosie nearly finished her certificate in IT before starting Clearwater Academy. All she needed was an internship. Perhaps Clearwater Academy's connections would be a pathway toward completing that requirement.

These Black women are not content with the paths their lives took toward the end of high school and after. Alternative education programs help Black women retool (upskill) their literacies for a different kind of relationship with labor: Journey and Clearwater Academy provide faster, accessible, and affordable literacy sponsorship (Brandt 2001) that help these Black women get three or four steps ahead and get back on track with their lives. Ironically, people like Alice go to these programs because they tried to follow the grand narrative of school-to-work/career and encountered poverty, racism, and healthcare challenges, stuff that knocked them out. Short-term training programs in workplace literacies take advantage of racism and poverty to get working adults back into to the economy but under the risk they perpetuate helping different industries exploit marginalized people's labor. Black women, however, come with lived experiences that help them assert the kind of labor and education they want, circumnavigating or undermining these efforts to exploit their literacies and coding literacies for a labor market.

What Literacy Work Conditions Teach Black Women

Stepping away from the grand narrative of education led Black women to navigate contingent low-waged work. Often, these jobs looked like "women's work." For example, the literacy work histories detailed here include experiences in retail, banking, office administration, and nursing assistantships. Many circumstances made these jobs temporary or subject to ending in a short time. Halima worked under a six-month contract in IT support for faculty at Sakowin University; Alice spent her entire professional career in banking and even received a modest promotion, but company mergers pushed her out of these positions. Black women in this study got the message their working lives were easily replaceable, temporary, and out of their control. Moreover, their lives as single mothers didn't fit neatly with their jobs' expected literacy work practices. In some cases, employers were unsympathetic to their parental responsibilities. Jumping from job to job, moving from place to place, risked these Black women's lives; a new start didn't always guarantee a balance between literacy work, labor, and motherhood but rather a continuation of oppression. In this section, I explain these literacy work conditions and how Black women tried to navigate them to regain respect as literate subjects while taking care of their families. Rania and Halima gave the most detailed window into their literacy work conditions, so I focus on their stories here.

Rania accrued plenty of credentials after high school: a year of medical assistance, certificate in pharmacy tech, domestic violence credential, and a certificate in teaching middle school and high school students. Yet these credentials gave Rania access to low-waged work that was often unequipped to address her domestic abuse. Rania loved her job in customer service for a big, well-known insurance company based in the Midwest. But the domestic abuse of her childhood had followed Rania into adulthood. In the early 1990s, Rania gave birth to her second child—a son—by Cesarean section. The doctors didn't resew her properly, so Rania had to go back to the hospital for a second procedure. While finishing up her medical leave from the insurance company, Rania's partner suddenly decided to move the family about an hour's drive south of work. "And it's like 'Really?'" Rania complained. "He knew I had to go to work so why would I be pick up then to go out of town? And he didn't show up and I was scared to leave." So Rania decided to not return to work, for fear of her and her children's safety. She called her office and left messages about what was going on, but they fired her anyway. Rania suspected that "they wasn't into domestic violence and didn't know how to help people." Being a victim of domestic abuse reduced Rania's value as a literate subject. The workplace could not protect her humanity, but they were well prepared to extract what knowledge they could from Rania.

Because she already had to stay home and take care of her children, Rania got a daycare license and tried family daycare for a while. And then she returned to the office in 1996, this time working in banking operations. In this position, she answered external and internal calls and prepared and researched checks for customers. Rania loved that job, too, because she could directly serve people, but once again domestic abuse blocked her literacy work practices: "I was getting harassed at home plus harassed at my job. So I left [that bank] even though I loved my job." She tried to transfer to a different position in Sakowin with the same company. By then the bank was in the middle of a merger, and Rania believed "they don't want to hire no Black person." She had no job lined up in Sakowin, but she moved to there anyway. Rania believed she had "to keep running and you know when you're young and you don't realize you got to get rid of the problem. If you don't change something, you still gonna be stuck. I didn't know that then." Rania got a certificate in pharmacy tech that she later parlayed into a job with Walgreens. But Rania was reluctant to take it. She would be working nights, and she was just "scared" to leave her kids, even if they had a caretaker while Rania worked.

Halima faced similar concerns about balancing family life with the demands of literacy work practices in her own history. She once worked as a case manager for an insurance company in Sakowin. The position for special case manager later became vacant, so upper management asked Halima to take the promotion. She really didn't want to, even though the promotion was a sign that the company had recognized and valued her digital literacy work practices. They even offered a significant salary bump. No wasn't an option: "If you don't take this promotion, you're gonna get fired," Halima recalled. She had been coerced into becoming a stronger asset for the company, but the new position left her family life out of focus. "It was so hard for me," Halima said about the schedule change. "I had to go from 7:30[in the morning] to 4 o'clock [in the afternoon] to working 11:30[in the morning] to 8 o'clock [at night]. And this was so terrible because I had to get my two kids somewhere to be when I'm not there. So I had to get daycare providers because they were still young so not school-aged level. I had to pay even more. I had to pay the daycare provider more money." Thankfully Halima negotiated switching work schedules with a co-worker. She had begged him for help, but he didn't need much convincing: just the fact that she had to take care of two kids was enough for him. Halima thanked the co-worker with a fifty-dollar gift card to Best Buy and took him out for drinks at a local gay club. Without his help, and not the help of the insurance company, Halima would have to minimize her raising her children directly, shifting that responsibility to a paid stranger.

Rania's worth as a literacy subject depended on having a stable home. Lacking resources to address her personal life circumstances hindered Raina

from doing required literacy work. Immediately, Rania became less valuable, as it's easier to get a different literacy subject with a good household than struggle with one who doesn't. Meanwhile, Halima's story provides a different lesson: if you do make work a priority, you may lose your time with family and their well-being. The labor market, then, can favor "normal" family life over others, namely some support waiting in the wings while the mother works. Labor markets may push out single Black women from important opportunities that allow them to leverage literacy work into reaching their full potential. Even the "easiest" low-waged work can be *inflexible* to their needs. Black women participants learn that their domestic life has no place in the workplace. They witnessed and experienced how literacy work disrupts family life. Coding literacy, with its cultures of flexible work, may break that generational experience and offer a match between what they want for tech and what they want for life.

As they took on vulnerable work, Black women participants also reported varying kinds of literacy work conditions that shaped how they understood their relationship with labor and thus how they understood what work ethics mattered for literacy work practices. Remember Rania again: She knew abuse in childhood and abuse in adulthood. Now, in her literacy work history, she recalled *professional abuse*. After her declining a pharmacy tech job with Walgreens, Rania jumped at the chance to work as a receptionist for a social services nonprofit. She got the job because during her interview Rania's ankle bracelet got snagged in her stockings. She had "kept my legs crossed the whole time. And that's why I got that job because they said if I have that much patience and discipline—because I had to have somebody unhook me after the interview. So that got me the job. 'If anybody could not show that on their face through an interview, then we want you.'" But Rania did not have patience for the shenanigans that happened over the next five years.

First, the organization's relationships hinged on nepotism and whiteness. Rania's direct supervisor was "very abusive and annoying." He would take forever to get back to the office and cover the front desk so Rania could take her lunch break. He would ask Rania into the conference room "just to cuss at me, and I'm like, 'Ooo! That's not how you treat people!' And I'm grown, too. It's like, 'Really?'" Rania could not complain about this abuse, or any of the unethical work practices she witnessed, to the president of the organization. He had become quite fond of her direct supervisor because he "kissed the president's butt and did everything for the president but treated everybody else like crap. And as long as the president was taken care of, he was satisfied." Second, Rania never moved up to a better paid position as an executive assistant despite spending five years delivering expert literacy work to the customers. She had "always come to work and I smile, and I try to do my best." Rania

"loved the clients. People who came in really loved me, respected me. All of that." But no one promoted her. One strike against her was education. She had plenty of other credentials and a range of experience working with people, but she didn't have a college degree. Second, they didn't like how she talked. Rania wasn't "professional" sounding. A third strike was that she competed with a white office assistant who had less experience than Rania. They chose her over Rania for the executive assistant position. The news made her livid. "They weren't moving me up in the job. It was a dead-end job," Rania concluded. "They weren't trying to promote me. They weren't trying to do nothing. They didn't even give me a raise. And I been there five years and I think in that last year I got a dollar raise." Clearwater Academy would offer what Rania had been denied so often: A chance.

Rania accepted that her work was never going to respect her literacy work practices or even her well-being. She returned to education. Like other Black women in this study—Halima and Alice—Rania got into the accelerated humanities course Journey. She then leveraged those few college credits to jumpstart studying visual communication and media at a community college while working at the nonprofit. Rania had lost interest in her current job because they had no interest in her, and that became even clearer when the nonprofit began downsizing and phasing out jobs. They offered Rania a choice, however: work full time and abandon school or resign. School had become a hinderance to the interest of the employer. They needed Rania's literacy work practices throughout all hours of the day, what with the elimination of other positions. She was valuable but still disrespected. Rania chose school because "I wasn't about to drop out of school when I was that close to graduating. So not really. I had a year to go. So I chose to graduate. So bye-bye." Rania's literacy work history paused for a decade after she graduated. She moved to Atlanta and focused on raising her children and grandchildren.

Experiences in certain literacy work conditions taught Black women participants what they truly desired from labor, a vision for themselves that needed to be activated in some way by some educational institution. Participants believed educational institutions have a responsibility to help them access their mind and their social and material needs. Halima had a thorough understanding of the kind of relationship she wanted with work through her digital literacies. After working retail and customer service, she landed a contract job with Sakowin University's IT department as help desk support in 2014. (Incidentally, Halima got the job after completing a training program through the same nonprofit Rania worked for). The work was "so boring," Halima told me. For the first few weeks she helped college students solve simple, everyday user issues. Halima thought the work was monotonous:

"I got locked out of my account or whatever."

"Okay, here you go."

"Oh, I don't remember my password."

"Okay, I just reset it for you."

The department transferred Halima to a different office that assisted college professors instead of college students. The work was a little more interesting to her. Halima imaged computers and delivered those computers to professors and answered more technical questions than what she got from college students across campus. But there was a limit to her patience with professors. Halima expected world-class researchers to have more knowledge of computers but "they were more focused on their adult learners and everything and did not know how to work a computer. It was really, it was like so hard not to say, 'What in the world!? Do you not know that your computer is not on right now?'" But most of the time she sat in a cubicle not having much to do because work was slow. She begged her supervisors to give her more deliveries to get out of the office. Otherwise, Halima would "Check e-mail. And also at the time I was going to school at Journey. So in between all of that I was doing papers, I was writing papers. And I'm like, 'Dang, they are not challenging me. If I can write a paper, image five computers, and do tech support all at the same time, they are not challenging me.'" Halima fell asleep a couple times while on the job, and she admitted as much to her supervisor. "And I tell them why exactly I fell asleep: because I'm bored. I did everything I had to do. And I need more work." Still, Halima said she was grateful for working with computers so closely, so intimately. She just wished she could do more than what tech support offered. Something in the labor market that offered digital literacies that helped her "access her mind" in ways not known before.

If IT taught Halima desires for deeper engagement with digital literacy, the literacy work conditions before that job taught her how she would want to treat herself and be treated by employers. After a three-year stint in retail, Halima spent a few years in customer service in finance and insurance. She worked for a credit card company where she activated users' accounts. From there Halima took on more complicated literacy work practices like "going through people's accounts and answering more in-depth questions." That company closed three years later, so Halima had to find a new job to support herself and her children. That new job was in card acquisitions on the seventh floor of a building where she called small businesses to persuade them to accept American Express credit cards. Getting merchants to take American Express was a tough sell because the credit card fee to the business was so

expensive. Halima needed to use rhetorical tact to convince them that in the long run merchants would make more money.

Alongside perpetual boredom, the literacy work conditions felt confining, distrustful of employees, and exploitative. At the credit card company, Halima worked in a cubicle with just enough space for decorations, like "my stuffed animals, my beanie babies, pictures of my kids, everything like that." But over in checking, employees worked in small, tighter cubicles. They could barely stand up. Knowing what they went through changed Halima's perspective on her own cubicles. Even though she had a better set up than other departments, she began to associate cubicles with prisons. Surveillance tactics underscored Halima's feelings about being in prison. She recalled, "I can't leave this until my scheduled break. They even had us check our break time. If you … so on our phones, you know because it's a cubicle and everything, on our phones you have to logout of your phone. If you log out at the wrong time, you get written up. If you have to go to the bathroom, you have to go [inaudible]. And if you use too much of your break time, you get written up. I felt like I was in prison. And that's why I hate cubicles."

Customer service also exploited Halima's digital literacies, another feature of the prison-like literacy work conditions. Her superiors ran an assessment on her performance selling cards every two weeks. At these mandatory meetings, her superiors "would review all of my calls, and any call they did not like, I had to explain why that call did not go good. Why I did not make that sale. It was very very difficult." Apparently, Halima's recordings were great examples for training sessions with new staff. She didn't learn that her superiors were using her own recorded sessions until she was sitting in one of these training meetings. As the recording played, trainers discussed what callers needed to do and what to avoid. "So this is how people treat me all the time," Halima explained. "'They don't want to acknowledge me, but they'll use me. American Express did that to me." They fired Halima soon after for not meeting her quotas, but she guessed, at the time of our interview in 2017, that the company was still using her recordings to their benefit.

These literacy work histories show challenging and frustrating opportunities where the labor market underuses or exploits Black women's literacy work practices. On one hand, they are important assets. However, their worth as workers suits the bottom of organizational hierarchy, where they uphold the day-to-day lives of better-paid employees and supervisors with more value as workers. Low-waged work exposes Black women to exploitation and disrespect, and their social status as Black women may justify this treatment under sexist and racist bigotries. While low-waged work suggests to tech an absence of digital literacies and important sociocultural understandings of the workplace, Black women in this study uncover how workplaces dictate

what they can and cannot do with literacy work practices, and to what extent those practices help them achieve their full potential as Black women and literate subjects. Forces beyond their control sometimes create the kinds of résumés they bring with them to computer code bootcamps and the tech industry itself. Those lines on their work history hide such issues in the labor market, private industry, and the economy. It's difficult to be a valuable literacy subject when you don't have the capital that protects you, capital these Black women attempted to gain through school in early life and as perpetual returning adult learners.

In this section, I have shown the irony of possessing education and digital literacies to meet the demands of low-waged work. They accepted positions that needed to be filled but then those same employers discounted their literacy work practices and in some cases their responsibilities as mothers. The literacy work conditions they encounter –not the low-waged work itself-- appear more harmful to their financial and social well-being. But these Black women also made significant inroads in their digital literacy development despite falling off track from higher education or having a tumultuous relationship with these human capital-making machines. On the job training is commonplace, but it's the combination of learning new literacy work practices with a variety of literacy work conditions that creates a formula for imagining better futures. In the final section, I turn to these Black women's desires. The power of retrospection and forward thinking allowed them to clarify their work ethics; that is, in their interviews Black women began to see a passage to what kind of labor they desired, what they wanted out of their own literacy work practices, and how Clearwater Academy could be a bridge into these possibilities.

Coding Literacy: A Bridge, Not a Conclusion

Low-waged work and their accompanying work conditions taught Black women in this study new ways of understanding their relationship to labor. Looking back, they began to understand how their lived experiences and non-tech jobs overlapped with tech; ideating potential work helped them articulate how tech could help them access their full potential. Clearwater Academy was to be a bridge to accessing these desired work ethics. I write a "bridge, not a conclusion" to highlight how these Black women did not fully buy into the computer programming pipeline that Clearwater Academy set up as a goal for their job training. they thought of other related careers that better aligned with their lived experience and work experience. The assumption that these women, and their peers in the class, were either a best fit or no fit for the tech workplace set aside the work ethics they held for themselves. This mismatch between labor

expectations of the coding movement and what Black people wanted plays out further in Chapters Three and Four. Here I describe how Black women in this study wove together prior literacy work practices, private digital playgrounds, and lived experiences into desirable future literacy work histories. Clearwater Academy represents a culmination in these imagined futures.

Take Myra, for example: she entered the program expecting to come out as a coder, but with her background as a certified nursing assistant, she thought that would be impossible. Myra heard about Clearwater Academy from "a bunch of people." She did research on the program first and concluded, "Oh this gonna be crap." Not because she thought Clearwater Academy itself was crap; Myra said she had a long history of never finishing anything. She would return to yet another education opportunity only to quit. She assessed her skillset during our interview, saying, "Like I can't draw. I don't know what this coding stuff is. I don't know—like craziness that was going through my head." When she started Clearwater Academy, Myra struggled with web design: "I didn't know—when it came to web development and web design—I didn't know what the hell I was doing." She gave herself three weeks and if the program didn't work, Myra would dropout. But then she spoke one-on-one with Richard, and he introduced her to project management. Myra learned what wasn't readily apparent from listening to discourse about the coding movement. "When I went to like doing project management and information analyst, I was like 'Oh I do this shit every day.' So that's what made me keep going."

What "shit" did Myra do every day? That goes further back to her childhood when she witnessed how Black carework at home turned into literacy work. Myra's mother relied on the carework of her grandmother for years, until she moved out and Myra's stepfather was in prison. On days when her mother was ripping and running in the streets with men, Myra stayed home to look after her siblings. At the time of our interview, Myra's mother moved to the health department working with "people who are children and young adults who are transitioning from foster care. That's her thing." Myra also knew in her personal life the value of forming strong bonds with others. Although her mother and biological father were separated, Myra's father still came around to see her. And then he was convicted of murdering a child he had with a different woman. He was serving a forty-five-year prison sentence. Myra attempted to reconcile with her father, to patch everything over. She did what she could, explaining, "I reached out to him. I made peace with my father. Yeah, because if I didn't, I wouldn't have this healthy relationship with myself." Myra learned to develop her emotional intelligence to center herself, to center her own narrative. Myra, having confidence and respect for herself, could focus on her other family members. For her low-waged work, Myra followed in her mother's footsteps and got hands-on training in CNA.

She was never certified and wanted to continue her degree in social work and psychology. These interests turned into assisting the elderly for many years.

So the "shit" she did every day as a CNA was like project management. As a dietary aid, Myra, according to her résumé, "cared for the residents and their personal hygiene and assist them during mealtime," including "Perform light housekeeping for the residents." As a resident assistant, Myra "Provide for the daily physical care of residents: showering, dressing, and any other hygiene needs" and "Administer medication, record vitals and glucose levels in the resident's daily logs." Her position required attention to patients' bodies, mental capacities, and emotions as they followed a daily routine that made their needed carework later in life comfortable. A project manager leads a team of software engineers to hitting project goals and objectives, from start to delivery of the product or feature. It too requires careful attention to routines, the needs of team members, and strong interrelationships. Myra conceived of how foundational computer programming was to the world and she had the lived experience being cared for and caring for others that strengthened her literacy work practices as an important value to tech. Perhaps she didn't need a new set of technical and social skills, but rather a framework for harnessing past experiences into new assets.

For other Black women adult learners, computer code bootcamps like Clearwater Academy were opportunities to reignite other literacy work practices learned years before. Rania spent a lot of time away from computers at home after she moved to Atlanta. She had bought a used home computer from someone, but it didn't come with all the pieces she needed to make it work, so Rania threw it away. For the next six years, Rania had to live for her children. She wasn't really concerned about doing more with computers than what was needed at work, which was at most data entry. "I was trying to survive," she said. "Raising them. Taking care of them. Couldn't drive. Still can't drive." I interviewed her again later to clarify the timeline a bit. She reiterated how computers mattered little to her because "I was in Mommy mode. Being a wife. Being a mother. So a lot of things that you need to do [for yourself] are on the backburner. So everything else comes first." Rania relied on public schools to teach her children reading, writing, and digital literacy. She didn't buy a Dell laptop until 1999 or so for her first daughter when she started college.

Once her children left the proverbial nest, Rania was back on track to learning for herself. She attended a community college to get her degree in visual communication and media back in Sakowin. "I just—what I had at [Sakowin Community College], what we did was, designed it in Adobe. Slide it up. Do it in Dreamweaver. And in Dreamweaver code it. You didn't have to worry about it. And they did the very basics. Nothing, you know, real in-depth. Just the basic HTML and then you learn, you know, CSS and

Dreamweaver." I wanted to inquire about the motive for this learning, if it aligned with other participants' literacy history interviews—learning out of curiosity, to poke around and tinker. Rania flatly said, "No, not really." I was taken aback. Rania "loved to design," going back to her childhood drawing to escape or process her feelings about domestic abuse. The computer was just a tool to get at design. "I need to do this to get here," said Rania. "But I didn't like it—I never loved numbers like that. So I didn't want to—I never had a dream to take the computer apart, see what made it think, all of that. I just wanted to design." Rania had done freelance work since 2008, a year after she graduated from Sakowin Community College, but she had not learned to make websites go live, or learned HMTL, CSS, and JavaScript to make her designs pop. Rania laid down this wisdom to explain what Clearwater Academy meant to her: "Life happens, and you don't get to do the stuff that you love to do. You start living for other people. And that's pretty much what happened, and it was like, I need to do a transition to better myself, to better my life. And so this was just like transition to get back to doing what I really love, and not to be idle and stuff like that." Clearwater Academy would extend her literacy work practices further.

Computer code bootcamps like Clearwater Academy would also give Black women adult learners access to the private digital playgrounds they created as children. Zelda was drawn to marketing while working as a nanny and as a ghost writer for a mother who labored as a sex worker. Thanks in part to her playing with HTML and CSS through Myspace and BlackPlanet and with photo editing in her spare time, Zelda created ads to attract clients. The mother was so impressed by the results she recommended Zelda to other sex workers. Although she would later fall out of this well-paid work ("I became a normal person"), Zelda never stopped paying attention to social media's development. Zelda had rich knowledge on the viewing habits and content creation practices of Generation Z social media influencers, who at the time of our interview in 2017, would be twenty-one and younger. Zelda wanted to make at least 75,000 dollars a year—adjusted for inflation in 2017—leading a social media marketing firm. The firm would target Generation Z because they're the "people with the real buying power. Very soon they'll be the ones with the buying power." Where do they get their information? YouTube. She recalled viewing a Snapchat story about a nineteen-year-old social media influencer.

> So back in the day people used to play with Barbies and dolls. If you ever look at a kid that's seven or eight and they're on YouTube, they're looking at videos of people playing with action figures or dolls or something. They're not doing it

> themselves. They're literally watching people open the boxes and play with them. And they get hella views. But YouTube pays for views. And then depending on how many subscribers you get and views you get, they pay you and then other people endorse you. She's [a social media influencer] only like twenty-one now and I think she probably makes 1500, I mean 15,000 a week. And she's endorsed by Nike?

Zelda was thinking about how to market to future generation of Internet users with real buying power. She not only understood viewing habits from watching her niece and how social media influencers made money; Zelda considered research on Gen Z's philosophical outlook, too. She argued that you must observe that Gen Z "aren't as racist as previous generations, for one. And more open-minded to things and they take different things differently than other people do. They get offended by shit, and they'll let you know." Zelda thought she was best prepared for social media marketing to Gen Z Internet users. Thinking back to those days creating ads for sex workers, Zelda found she was "really good at coming up with catchy things. I like marketing." Clearwater Academy would be a bridge to her desires form for this kind of literacy work practice. The credits could go towards an associate degree and then Zelda would transfer to Penn State; meanwhile, the coveted internship opportunities that could turn into out-of-state job opportunities – all next steps, based on Zelda's desires, for starting a digital marketing firm. As for coding, Zelda thought "it was cool. It's not cool. I just do it." She thought everyone—not just Black people—needed to know something about the building blocks of our digital worlds, especially given that kids are doing it and could "take our jobs" at age 14 if they wanted to. But computer programming wasn't a conclusion for her; the credential and the experience overall would apply to new work ethics for literacy work practices.

Completing training in employability and coding literacy helped solidify Black women participants' identities and social positions. Rosie had admired the IT profession in high school but took "a detour" to help family. As explained above, she had always been a returning adult learner—whether studying IT in a certificate program or volunteering to develop software packages for clerical workers at her job with the state. Rosie, like so many other parents including ones written about here, was both a mother and a teacher to her children. For the most part, she let school teach her children reading and writing and computer use, but she supplemented their learning on the side. Rosie introduced them to Mavis Beacon to learn typing, and she modeled typing for them when she worked on the home computer. "Some kids didn't have that at home," Rosie recalled. "So I was fortunate enough that they had something to see it like that.

If they didn't know something, if I knew about it, I could tell them. Or at least be a resource or ask this person or something like that."

Be a "resource." Rosie often talked about being a "resource" or a "connector" to resources. She had helped her oldest son follow a path toward studying computer science because she knew the right places and the right people for buying computers. "Like this one guy I went to school with," Rosie explained. "He was involved in a program with the Girls and Boys Club, and they showed the kids how to build their own computers. And at the end of that program, you know, you can keep the computer. That sort of sparked their interest in computers and working with the computers." Rosie thought digital literacy was a fun thing for them to learn ("Oh, here's more stuff for my children"), even though she had already imagined working in IT years ago. The importance of computers to everyday life didn't dawn on her until she met friends and family in her own generation who didn't know "about e-mail or how to search for a job on the Internet. How to find information, like Google. Anything you want to know about … You know, 'What is Google?' You know information is just so vast."

While she started as a resource for her children, Rosie suddenly found herself being a resource to others. People in her community came to Rosie asking for help on writing résumés and using computers. That started ten or fifteen years before she signed up for Clearwater Academy. If she was going to be a resource to family and community members, Rosie knew she needed "'a lot of help. Because with the way the world is changing, everything is on the computer now. Everything. Even something as simple as you get an Uber. 'What's Uber? You have to know about computers … on your cellphone to get order an Uber. You just can't call up Uber on the phone?'" Luckily, Rosie had already been a lifelong learner. Younger family members and her children became new teachers, and she used Khan Academy for more information. While she was grateful for the vast number of resources, Rosie spent little time with them—a few hours here and there, and then a long break that stretched for several days or weeks. "I always have a thousand things to do," Rosie said, "and so to fit something else in it or on it is a feat in of itself. If you want to learn something, just fit it in where you can get it." She was diagnosed with lupus in 2016. Her doctor suggested Rosie go into early retirement to take care of her body. Suddenly, Rosie had more time for learning. She had known about Clearwater Academy from a friend. Being out of the economy as a literate subject, Rosie could now take on the computer code bootcamp fulltime.

Rosie imagined continuing to use her newfound literacy work practices into furthering her resource mission. First, she thought of working with small Black-owned businesses. She knew of some mom-and-pop stores that had not switched to e-commerce or had not accepted digital payments; this left

some Black business owners of her generation behind in local competition. Rosie could be a resource to them, teach them how to take their businesses to the next level. She also imagined turning her culminating class project into an actual event: Black Women's Wellness Day, a conference that promoted healthy living among Black women. While she would accept an internship, if possible, Rosie hoped that job opportunities would allow her to travel and work remote, something she had never been able to pursue because of work and taking care of her mother.

Alice also imagined a different relationship with work after finishing Clearwater Academy that would help her reclaim Black motherhood. In a scholarship essay to Clearwater Academy for utility bill assistance, Alice recalled growing up with "an absent father and an overworked abused single mother who never had time for my siblings and I." As an adult, Alice felt "a tad resentful that I was never able to attend any extracurricular activities because my mother was always busy working or simply too tired to go." Alice recognized going down a similar trajectory with her children—minus the abuse—and tried her best to "support my girls in anything they want to do no matter the subject." But going to Clearwater Academy fulltime and studying for the Journey program without unemployment benefits strained Alice's relationship with her daughters.

After finishing Clearwater Academy, then, Alice wanted to go back to school and get a bachelor's in computer science, but for work, she would use coding literacy to combine her long experience in banking and finance with IT. But the job would ultimately help her make up for lost time with her children. She writes, "Ideally, I would like to work from home in a position that would allow me to travel and spend more time with my little girls while they are still little." Devoting herself to motherhood mattered, and a good job would help not be "distracted with creeping thoughts of mounting bills or hunger pains, or one-on-one time where they [her daughters] can tell me everything they haven't had a chance because I have been too busy chasing my own dreams." Alice imagined a work ethic with computers that drew on her history in low-waged work while also giving her the freedom to enjoy Black motherhood in a stable, financial environment. In other words, Alice imagined work not for work's sake, and to satisfy the tech industry's need for innovative culturally response designs and for diverse coders; she imagined learning coding literacy to arrive at a different Black life altogether.

Finally, Halima understood coding literacy, and any career in tech, was an opportunity to reach her full potential. Recall that Halima spent her literacy work history doing boring work; while she was good at her jobs from card services to IT help desk, she had not thought her literacy practices gave much worth to her well-being. She began to ideate a future career in tech

while working in the baby department for a well-known coat retail store. They used Linux for their computer software, and Halima learned it better than anyone else, even the managers. She really began to imagine new possibilities for herself and her family in tech while completing training in IT from a local nonprofit. During class, Halima would learn how to take apart computers and put them back together. The process was fun! Then, working for the university IT department, Halima had to dispose of old computers, and "I was just like 'Dang how are they doing this, and how many companies are doing this? I don't think there are enough companies that dispose of old technology. Maybe I can do it.'" The company would be called Obsolete, and the company would properly recycle or dispose old technology. Her first employees, Halima said during our interview, would be her three children, the ultimate family-bonding activity. She joked and said they would "work for free" while Halima worked to make the service a profitable project.

However, Halima also believed working with computers—whether computer programming or something else—fulfilling to herself; that required a real challenge and a meaningful social environment. Learning coding literacy at Clearwater Academy helped her "feel like I'm living up to my potential using my mind." Doing the drudgery of IT work was so easy she could complete tasks "half asleep with one eyeball open." But computer programming challenged her in a fun and engaging way. Coding was a "refreshing challenge; I'm glad it's hard like this because if it was easy, like 'Why am I doing this?'" Learning computer programming at Clearwater Academy required both eyes open; you "can't fall asleep" on coding literacy. And Halima felt at home learning coding among other like-minded low-income women and BIPOC. With her children and even co-workers in IT, Halima felt like she had to simplify her language. When I asked about what she talked about, Halima wasn't sure—she was just talking to, perhaps "the wrong people." But at Clearwater Academy Halima loved being around people she could relate to. Halima had been searching for a literacy work and literacy work conditions that gave her options to express her Black knowledge among people that affirmed her humanity and knowledge. Working on Linux was a return to the days she spent practicing web design. Clearwater Academy offered opportunities to develop her digital literacy skills in ways not offered through low-waged work in the IT department. Throughout her literacy work history, Halima develops a picture of what she wants to gain with coding literacy being a tool to reach those ends.

Black women adult learners did not erase their histories of low-waged work, as they were formative for developing relationships with literacy work practices and digital literacy practices more generally. They took stock of their literacy repertoire and how they had moved through the world and found computer programming another opportunity to propel them forward. Some

low-waged work remained valuable as a springboard to imagining how obtain different kinds of work in tech aligned with their work and lived experiences. Rather than Clearwater Academy turning them into coders, the six Black women in this study flipped the computer code bootcamp around and started using it as jumping off point into more meaningful and relevant labor. Leveraging computer programming to join a class of knowledge workers would reward them in the long run access to what has been a legacy of denial in the United States since 1619: family, community, and social mobility.

Conclusion: A Black Woman Coder Wanted

Coding movement discourse gives computer programming the mythical power to drive social mobility and a diverse workforce in tech across many positions, but especially in software development. Language about coding literacy and what dictates its use carries ideologies about race, class, and gender. Communities of computer code bootcamp instructors and administrators and their tech company partners carry these biases and create stories about what knowledge adult learners of computer programming should have already, what kinds of labor matter to the industry, and how they should look and be in each technological workplace. These stories construct evaluative worlds of judging others and themselves (Gee, 2011). That gas station attendants should not be in tech, as one tech sponsor said to Richard, suggests some people attending computer code bootcamps don't know how to appropriately interact with coding professionals, or fit in their figured world, and their literacy work history somehow confirms that evaluation. Such discourse veils itself in intersectional oppression, which animates curriculum design in Clearwater Academy. Institutional racism, sexism, and poverty led Black women adult learners to rely on low-waged work as a safety net. In these positions, their work has value to their employers and the institutional systems they support (finance, healthcare, retail, etc.), but under some literacy work conditions Black women participants found disrespect and their literacy work practices limited or confined to gendered labor. This work can be equally devalued in coding: their literacy work histories are unrecognizable evidence that they have the potential to behave according to the work ethics of computer programming, as local employers practice them. Black women's literacy work practice can't be trusted, and they need new training. A clean slate. For a career as a software programmer, they require a restart to the norms of tech workplaces in addition to fundamental attitudes associated with computer programming (learning how to learn); and that training raises their worth as human capital to the tech industry. Constructing labor for Black women in this way already places them on shaky ground with computer

code bootcamps, as they can already be seen as failures on the verge of failing again because they have already failed before.

Black women's literacy work histories in this chapter describe one area of Black coding discourse that retell these stories and recreate their figured worlds, or Black tech ecosystems. What these Black women participants lacked in opportunity and privilege, they made up for with Black feminist knowledge on how to leverage literacy work practices into combating poverty and preserving themselves and their families. While these Black women never identified as feminists themselves, their stories reflect a Black feminist principle that experience with and knowledge of oppression informs unique Black feminist knowledge that helps the community enact a pragmatic, realistic future (Collins, 2009). Their experiences with digital literacies in the context of work and oppression informs their developing a new Black tech ecosystem that consists of desired digital literacy work practices (digital marketing, a community resource to Black business owners, etc.) and the kind of relationship with, or work ethic, that guide the motivation for their labor (reconnection with Black motherhood, flexible work, a resource to others, a contributor to Internet culture). With Clearwater Academy as a bridge, they, to borrow Alice's words, can journey toward lives they didn't think possible.

Chapter 2: Finding Access Points to Carework for Coding Literacy

> What makes code frustration so particularly maddening is that you don't know how long it's going to last. Maybe you'll figure out the bug in a few minutes. Maybe it'll take an hour or two. Or maybe it'll be *weeks* or *months* later and you still won't have figured out the bug, so you'll just bungee-cord it down with a nest of exception-handlers and pray to god it doesn't surprise you with a new one. Either way, this is what I tell people who ask, hey, could I learn programming? Sure, I say. Almost anyone can. So long as you're okay with unceasing, Sisyphean frustration.
>
> – Clive Thompson, "Programming Isn't Hard—but It's Frustrating"

> Love is an action, never simply a feeling.
>
> – bell hooks

In Fall 2016, I took an undergraduate course in Python. Because Python resembles English syntax, the computer science department considered it a "gateway" computer programming language into coding for beginners. The instructor gave a 50-minute lecture every Monday, Wednesday, and Friday morning to about 300 students and assigned weekly programming projects on Fridays that were due the following Thursday. We also had three in-person mid-term exams that the instructor administered during that 50-minute class time. The weighted grades were fifty-fifty: 50% weekly assignments and 50% mid-term exams. I was excited to dig into a new programming language at the start of the semester in anticipation of starting my research at Clearwater Academy.

Three weeks later I was an anxious mess.

My life that semester revolved around computer programming. I gave little attention to my other courses, teaching, tutoring, hanging out with friends, and even worshipping at my church. Every other hour, every other minute, between Friday and the following Thursday, I coded, and I used every support the class gave me to survive that semester. I went to Monday lab where I could do pair programming and get help from a graduate teaching assistant. I visited

my instructor's office hours where I sometimes stood in a line with other students outside her door; I went to another office hours with a graduate teaching assistant (some days I would go to my TA and then a few hours later go to my instructor's office hours). I sometimes called my friend who was a computer science major to find bugs in my code. Every Sunday afternoon tutoring with undergraduate computer science majors started at 2:30p.m. in the computer science building, where I would join other undergraduates, some taking JavaScript, all of us grinding code, asking for help, tutors jumping from table to table. I remember the stress I felt when I saw a student complete their assignment and leave early to enjoy what was left of their weekend. Between one-on-one tutoring, I grinded code and consulted Stack Overflow, the premier online discussion website for getting advice on solving sticky coding problems. Each time I went in for help, I made small yet satisfying progress. I did well on these assignments and felt a boost of confidence that maybe next week, *next week*, I'll get it done with no help. Never happened. According to one graduate teaching assistant, the weekly programming assignments introduced me to important cultures and practices of coding. First, the assignments reflected what actual coding was like: collaborating with others, searching online for resources, breaking things as you go, all while under a tight turnaround date. Second, the weekly programming assignments were acts of interpreting and translating software design documents into code. This way of reading code required a different way of doing analysis, problem-solving, and ideating solutions I had never done before. I passed with a C+, not because of the weekly assignments but because I had no support for the three in-class mid-term exams. I still don't understand why weekly assignments—which reflected the actual work of coders—wasn't weighted more than exams, or why we needed exams to begin with. But that's the ungrading assessment scholar in me talking.

Clearwater Academy taught adult learners similar cultures of coding under a demanding and intensive curriculum. Their primary engagement with coding was through Wordpress and exercises on FreeCodeCamp, which required similar efforts to translate instructions written in English into instructions written for a computer. During class, Zeus, the twenty-four-year-old martial artist, and club bouncer from the Introduction, told me that he had not "forecast the severity of the workload we would really be doing" in the computer code bootcamp. He had taken half a semester of coding years before, so Zeus felt that he should have retained that information to be at least "semi-pro." He explained to me, "I picture myself being this computer champ, at least in my book, and understanding and being able to maneuver this [coding] so easily. It's very upsetting to admit that I was intimidated by it, ya know?" Zeus looked wistfully at FreeCodeCamp on his laptop. "It's an alien language right here."

Clearwater Academy offered job training and computer programming as interventions in Black adult learners' personal and professional interactions to change their odds against poverty and racism. Although learning computer programming was a struggle, what mattered most to participants was awareness that the policies, rules, assessment practices, and expectations that govern how to learn computer programming also governed how they lived outside of Clearwater Academy. While this observation can be true of education in general, the cultures of computer programming seem particularly different, as they require more than just discipline but also a different way of thinking about yourself and literacy. Through interviews and participant observation, I became aware that what Black adult learners really needed was a community based in carework. Pierre from the fall 2017 cohort said that computer programming and the possibility of a lucrative career brought him to Clearwater Academy, but *empathy kept him in the program*: "I'm like 'I wish there were more teaching.' But if it was *all* teaching and hardcore *the whole time* and none of the stuff we've done, I don't think that—I don't know if I would still be here. I feel like I wouldn't be *valued* the same as I am now." Pierre wanted his humanity to mean something to others; he wasn't another potential worker for a tech company. His education in Clearwater Academy should help him achieve self-actualization, or to become the best person possible creatively, spirituality, and mentally (hooks, 1994).

Clearwater Academy, and other adult and youth computer code bootcamps like it, try to intervene in lax diversity, equity, inclusion, and belonging, or DEIB in the tech industry; they join in other efforts occurring in college courses and in open technology communities. For years diversity advocates have called on Big Tech to recruit more women and people of color across all positions—from coders to middle and upper management—to rectify histories of white men dominating tech designs. While diversity, equity, and inclusion have been around for a long time, belonging—feeling safe in an environment and bringing full authentic self to a workplace—became prevalent starting around 2019. In *The Washington Post*, Jena McGregor (2019) writes that "belonging" has become the latest buzzword in Silicon Valley giving "the impression that other concepts haven't made enough progress retaining diverse employees." The George Floyd protests of summer 2020 seemed to galvanize many tech companies to dig into DEIB. In June, for example, DEI-related job postings in tech increased by fifty-five percent while major companies pledged billions of dollars to support this renewed effort (Maurer, 2020).

Scholars in computer science education have made belonging a critical topic for research in college classrooms. The range of scholarship suggest belonging is "positively associated with student outcomes such as their motivation, grades, interest in a field, and the intent to pursue college or persist

in the field" (Moudgalya et al., 2021, p. 445) while race, class, and gender, among other social identities, influence belonging. Scholars find that racially marginalized people can have as much interest in STEM as white people, but campus experience and classroom interaction disrupts senses of belonging for these marginalized undergraduates (Ong et al., 2011). Closely associated with these broad influences are how Black students navigate stereotypes often associated with being a coder: a white, straight, awkward man. Black people may "disidentify" with coding because they consider this "typical coder" the antithesis to their own identities. However, research on belonging may contain hidden biases: Solomon et al. (2018b) find that much research on belonging "were based upon notions of Black masculinity or white femininity. These understandings of belonging are indicative of the invisibility of Black women due to their non-prototypicality" (p. 3).

Partnerships between higher education and industry, even if implicit, create a pipeline of responsibility to diversity. But this partnership suggests DEIB provides profitable advantages to industry rather than benefit to marginalized people. DEIB in computer science and the tech industry are thinly veiled attempts at rectifying systemic bigotries to attract Black coders into the profession as "commodities used to enrich others" (Scott & Elliott, 2019, p. 376). STEM's labor system can resemble the labor system of sharecropping enacted after Emancipation: to ex-slaves, sharecropping seemed to be a desirable job until they learned it wasn't any different from slavery; landowners took advantage of sharecroppers who could not calculate yields or read contracts, trapping them in endless cycles of debt to the landowner. Black women sharecroppers received little social gain. Because they were ineligible for negotiating contracts with landowners, Black women gave the fruits of their labors to their husbands. In STEM, computer code bootcamps and other training programs present coding as a desirable job for Black people who "missed their opportunity," but that can be a ploy to attract Black people into for-profit institutions that make Black people enormous amounts of adult learner debt (Cottom, 2017). And even if they cross into those coveted jobs as software engineers, Black women have differential treatment compared to men and men of color in industry. Implementing DEIB in industry should not just focus on developing coding skills but also develop "better knowledge about the social systems in which they intend to intervene" and "identify strategies by which people, and especially women of color, can emancipate themselves from systems of oppression" (Scott & Elliott, 2019, p. 379).

Open technology communities, another important site for digital literacy practices, also face challenges with diversity and inclusion, despite being more democratic and flexible than post-secondary education and private industry. Members believe that their Do-It-Yourself (DIY) practice coupled with their

hacking closed software culture philosophy can be used to hack their own majority white and male-dominated community. Unlike the profit motives of private industry, open technology communities use diversity and inclusion practices to promote "experiencing jouissance and a sense of agency" which community members obtain through technology use (Dunbar-Hester, 2020, p. 4). However, promoting more freedom for more people to harness the power of technology fails to address systemic injustice. Without a "robust appraisal of power, and of technology's role in reproducing social orders," even diversity advocates in open technology communities with their best intentions, have "the troubling potential to feed back into status quo arrangements of social and economic power [they] are nominally critiquing"(Dunbar-Hester, 2020, p. 4) As outsiders to the tech industry and thus unbeholden to drawing in marginalized people as commodities for profit, open technology communities are best positioned to interrogate power and technology. Their loyalty to technological agency forces them to stop short of true social justice practices, work that could emanate from the hackerspace to private industry itself, not for changing social structures in private industry but "because their power to propagate social analysis of the states" (Dunbar-Hester, 2020, p. 5).

The sample critiques of DEIB in the tech industry reflect broader efforts across institutions in general, from private industry to higher education. When an institution already embedded in capitalism adopts a policy and practice of diversity, they struggle to balance real change with institutional advantage. DEIB isn't part of the daily routines and structures of these institutions; diversity practitioners work to institutionalize diversity by fighting to bring diversity to leadership's attention. Although an institution will declare a committee or office for diversity, it will still sow resistance to the very people seeking change, what diversity practitioners, in Sara Ahmed's qualitative research, calls "'institutional inertia,' the lack of an institutional will to change" (Ahmed, 2012, p. 26). Instead of changing institutions, diversity must become "part of what an institution is already doing, when it ceases to cause trouble" (Ahmed, 2012, p. 27). Sometimes diversity becoming part of the institution involves supporting its whiteness; diversity practices "[change] *perceptions of whiteness rather than [change] the whiteness of organizations*. Changing perceptions of whiteness can be how an institution can reproduce whiteness, as that which exists but is no longer perceived" (Ahmed, 2012, p. 34, italics in original). However, institutions may have no qualms with completely ending diversity offices or committees. After the U.S. Supreme Court ruled that affirmative action was unconstitutional in 2023, colleges and universities voluntarily renamed or restructured their diversity offices; in other states, Republican governors put a moratorium on all DEI offices in universities across their states. As if following their playbook, tech companies in 2024 began pulling

back on their 2020 promises with deep, massive cuts to their rank of recruiters seeking marginalized talent (Keenan, 2024).

The marriage between coding literacy and diversity and inclusion can lack real institutional change or real social analysis of oppression not only in the institution (see Chapter 3) but also, most important to this chapter, the individual lives an institution recruits into its halls. While DEIB, especially belonging, creates community in tech workplaces, we may ask what kind of community and to what ends? And how does coding literacy get wrapped into these communal-building efforts? Coding literacy still supports the social order, and DEIB tries to create relationships that maintain technology's support of the social order, to prevent community from breaking down prevents the social order from breaking down.

My contention in this chapter is that computer code bootcamps can learn from Black adult learners about how communities of care become a foundation for opposing oppressive cultures and practices of code within these institutions. Carework, or care as labor, starts as a feminist practice of "relationship[s], of seeing and responding to need, taking are of the world by sustaining the web of relationships so that no one is left alone" (Gilligan, 1982, p. 62). Understanding human relationships as a web rather than a hierarchy creates "the vision that self and other will be treated as of equal worth, that despite differences in power, things will be fair; that visions that everyone will be responded to and included …" (Gilligan, 1982, p. 63). Working with a diverse workforce and deploying DEIB in software industry requires this ethics of care, but it is only, as I wrote earlier in this paragraph, a starting point. Black feminist scholars have critiqued ethics of care for centering "a predominantly white, middle-class, heterosexual feminine ethic as the basis for a supposedly feminist ethics" and lacking "the cultural specificity of what counts as caring" (Thompson, 1998, p. 527). In addition to inclusiveness, ethics of care leaves uninterrogated the power and privilege that flow within webs of human relationships.

Black feminist caring provides a more complex picture of care among Black communities. Carework responds to lived experiences with and knowledge of Black oppression rather than responding to personal emotions; caring reaches out from the Black family, which has never been safe in the United States, to society because Black families send their children into a racist world. Audrey Thompson's work informs my thinking on how carework operates in cultures of code. She gives a non-exhaustive list of themes from Black feminist caring scholarship: emphasis on authentic, trustworthy relationships; interpreting the world from a Black standpoint; a pragmatic approach to strategies that promote survival; and understand that social relations can be exploitative and oppressive (Thompson, 2004). Thompson concludes that caring, unlike ethics of care, isn't about addressing private or semi-private problems; Black

feminist caring "means bringing about justice for the next generation, and justice means creating the kinds of conditions under which all people can flourish … Love and caring do not step back from the world in order to return to innocence, but step out into the world in order to change it" (Thompson, 1998, p. 533). Diversity and inclusion practices in tech fails to show awareness of oppression and exploitation. These histories and current practices of turning Black coders into commodities for profit maintain dominant cultures of code. However, when computer code bootcamps ground care in the knowledge and experience of oppression they can transform Black experiences with coding literacy practices.

In this chapter, I argue that when cultures in tech and race diverge in computer code bootcamps, Black coders use carework to maintain the web of relationships needed to learn computer programming. Carework answers oppression while preventing the cultures of coding from creeping on adult learners, ending their attempts to learn computer programming. Looking closely at how participants and instructors maintain their web of relationships reflects the constraints Clearwater Academy puts on already struggling Black adult learners, but it also reveals the transformative power of coding literacy. I show that Black adult learners often didn't know until they came to the program that they needed a place where their lives were affirmed and valued (hooks, 1994). In this chapter, I tease apart what I call hustling and grinding for care, a rhetorical tactic to *re*-refashion their world after meeting the cultural practices that Clearwater Academy has asked them to live. The hustle and grind for care is an important source of labor in a computer code bootcamp. I advocate for its practice as a deeper commitment to social justice within literacy workplace education that train racially marginalized people in prestigious emerging technologies. Black feminist caring explains Black adult's experiences in Clearwater Academy and provides a conceptual framework to situate my analysis. Black adult learners' spoken words, storied actions, observed actions, and to some degree my own actions demonstrate how they discover new definitions of community that assists in pursuits of computer programming within the cultures of Clearwater Academy. As I directed my attention to Black adult learners' stories and actions, I came to find how much carework mattered to them while learning coding literacy.

My primary data for analysis are one-on-one interviews and what I call networked drawing. Asking participants to draw and then discuss their web of relationships came out of practical necessity. My schedule in the spring and fall of 2017 allowed me to visit Clearwater Academy only once a week. A lot can happen in eight to nine hours but that wasn't enough to create a complete picture of how Black adult learners lived their lives outside the computer code bootcamp. I took a more direct approach to understand what was happening

outside my participant observations, and asked each participant to literally draw a picture of how laboring for Clearwater Academy impacted their working lives and what they did in response to fulfill their life responsibilities while learning to labor for tech. Network drawing (see Figure 2.1) helped me discover a complete metaphorical and literal picture of how the policies, rules, assessment practices, and expectations that govern how to learn coding literacy can also govern how Black participants live their lives.[1] Maps have been used in other literacy studies before. Paul Prior and Jody Shipka studied academic writers' writing processes by asking them to draw representations of their processes. They then discussed those drawings with the authors. As Prior and Shipka (2003) point out, drawing assists with creating a thick description of literate activity. Looking closely at their networks of support and participants' stories about those networks, I can highlight the constraints Clearwater Academy puts on already struggling Black adult learners and their literacy activity with coding. The hustle and grind to assimilate reflects a hidden laboring of carework, a labor on top of unpaid labor.

Taken together, the following sections demonstrate how learning computer programming alone does not always intervene in changing the odds against racial inequality. Carework in cultures of coding extends that intervention further for Black adult learners in computer code bootcamps. Essentially, participants tell instructors, "Here's how you can help me in this community, not with DEIB efforts, but according to what community means to me." I first explain that the way Clearwater Academy restructures lives makes learning computer programming risky and tricky for Black adult learners; this section sets up the context for needed carework within and without the coding bootcamp that responds to this risky and tricky mission. Then I describe Black adult learners' philosophies of care—abstract concepts of what they expect from themselves and others to maintain their web of relationships. This section explains that these philosophies arise out of their ongoing interactions with computer programming, classmates, and instructors; they had different expectations of Clearwater Academy at the start of the program. Then I sample the concrete ways participants carried out these philosophies in two different ways: listening for oppression and offering a word of wisdom and accountability. These actions from a variety of sources in their networks led to holistic transformation of self, another unexpected result of attending Clearwater Academy. In the conclusion, I ruminate on how social equity can become an administrative concern in computer code bootcamps. Reframing cultures of code as access points to carework enriches the lives of Black coders in training.

1 I have de-identified names on some of the participants' maps.

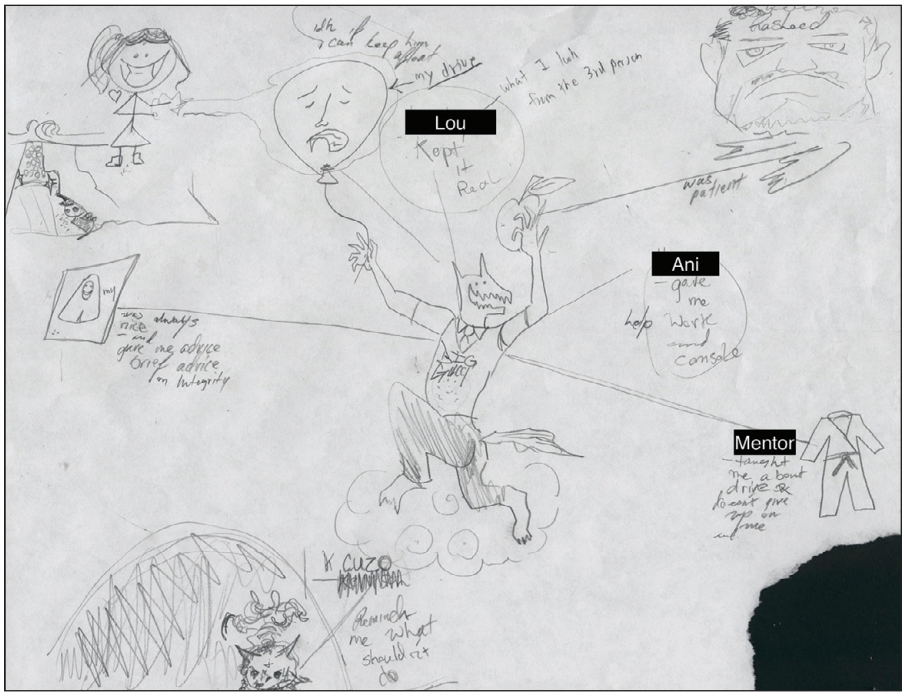

Figure 2.1. Image of Zeus' network map

"I'm Four People in One": The Riskiness and Trickiness of Coding While Oppressed

In this section, I give a high-level view of Black adult learners' lives in and outside of Clearwater Academy. In the words of one participant, coming to Clearwater Academy made life awkward and difficult, and that required Black adult learners to approach the next three-and-a-half months with care and skill. I show how participants understood that their learning computer programming meshed with life responsibilities, responsibilities that often required them to deal with financial inequality and family life. Coding—as an "alien language"—was hard for participants to grasp, exacerbating the difficult balance between life and training for human capital through computer programming. This section sets up the broader context for why Black adult learners hustle and grind for carework as an intervention while pursuing computer programming.

Black adult learners had relatively stable lives peppered with challenges from oppressive systems, but the introduction of Clearwater Academy augmented some of those existing problems. Halima attended the computer code bootcamp in spring 2017. At the time, she worked as a hotel housekeeper

cleaning guest bedrooms and bathrooms. This job marked a significant departure from her working in IT for Sakowin University under a temporary contract two years before. The hotel had just cut back Halima's work hours so bad that she would have to quit. While Halima was losing access to a livable wage, she lived with her three children in the Salvation Army's shelter for the unhoused. Her coming to the Social Justice Collective (SJC)—the nonprofit organization that offers Clearwater Academy as one of many programs to combat social inequity—led to some relief. She was eligible for their housing program, in which the nonprofit would cover one month's rent and the security deposit. Halima just had to find the apartment. A case manager in SJC suggested she apply to the nonprofit's Clearwater Academy training program. The sudden blessings of housing and returning to computing excited Halima: "And it's just like, 'Why would I be cleaning toilets when I'm capable of so much more?'" she thought. Yet the introduction of Clearwater Academy left Halima scrambling to restructure her life. After quitting her hotel housekeeping job, she had just a week to "adjust my schedule, because I have three kids to manage, right? I had only one week to adjust my schedule. And I'm still fighting with that. My whole schedule, getting my kids to school every morning, getting to training on time." Nevertheless, Halima was happy to be in Clearwater Academy among likeminded people who loved tech.

However, life in Clearwater Academy was hard for Halima; I noticed signs during participant observation and in conversations with her. Some were relatively minor, like sharing that she had gotten only two hours of sleep the day before, so she fell asleep during a long guest lecture on finances and budgeting. "I hope no one noticed," she told me a couple times (I hadn't noticed myself). Other problems hindered her from learning coding: at the start of the program, Halima needed new eyeglasses because her old pair were broken. Three weeks into the program she still couldn't afford them. Each class began with a stand-up meeting. Generally used in Agile project management, stand up is an opportunity for software engineers and other members of a project team to literally stand up and report on their progress for a project, what they planned to do for the day, and what challenges they needed help overcoming. In Clearwater Academy, instructors came up with different prompts for adult learners to answer in addition to noting their progress on their projects. On March 7, 2017, according to my field notes, everyone could share whatever they wanted. Halima jumped from her chair and shared with the group that she was grateful for Richard's—the technical instructor—teaching the day before: "What he said helped me change my thinking," Halima announced to the class. "I keep focusing on the negative lately because I have a lot going on in my life right now." The boundaries between learning coding literacy and taking care of her children blurred, or at times one interrupted the other.

Halima's attention was split between coding and lectures and the schools her children attended. During class she kept her smartphone underneath her left thigh in the chair to catch the vibration of a phone call or text message. Often the calls were from teachers about Halima's children misbehaving in class or even little things that didn't need any contact at all. To stay focused on Clearwater Academy, Halima had asked her children's teachers to not call between 9 a.m. and 5 p.m.; if it was urgent, they should email instead. "I don't have time," Halima told me during class. "I'm four people in one, and if you waste my time, I'll tell you about yourself." She wished the teachers had more compassion for her children; like herself, Halima's children were under a lot of stress from living in the Salvation Army's shelter. And they went to school where most likely many came from stable homes with lots of resources. Lacking a job, proper housing, and having mouths to feed all at once, Halima dropped out halfway through the program. When low-income Black adult learners restructure life for Clearwater Academy, because the computer code bootcamp demands their time and energy, they shift their life carefully and deliberately. But what cascades from that is more struggles with inequality. Halima is a cautionary tale where the balance or boundaries are lost, physically, emotionally, and mentally, and that pushed her out from the opportunities to learn coding literacy.

Other Black adult learners pushed themselves into financial strain to make Clearwater Academy work in their lives. Zelda attended the computer code bootcamp in fall 2017. Her father was impressed that she could stick to the job training because she made no money from Clearwater Academy and there was no emergency fund she could use to stay afloat. Zelda was surprised herself that she was making it so far. Alice felt the consequences acutely as she reflected over her network drawings. She had no job at all while going to Clearwater Academy, other than working a two-hour shift in Journey's office, an education program that offers humanities courses to low-income adults for college credit. Alice got laid off from her job as a banker and had the opportunity to take another job in a different department. But she thought the layoff was a sign to try learning coding literacy. Alice had known about it for a while. There was never "a time when I had a healthy … a time when I could exit and wouldn't be just up and getting a job." She had the support of her partner who worked and made enough money to support her and her children, but they as a family had still been in difficult situations. For example, Alice never received unemployment benefits because the government considered her a "full-time" student attending Clearwater Academy. Without a consistent check, Alice often worried when the power company would shut off her electricity. To make ends meet, Alice was "proactive in disconnecting luxuries such as my personal cellphone, cable service, and Internet. But by

disconnecting my Internet, I introduced a new challenge: How can I study Internet technology with no Internet connection?" Even if you worked, you didn't work all that much to make barely any money. Myra worked overtime as a certified nursing assistant "making 2000 dollars in two weeks. Like I lived at work. That's how I was able to bring home that much money." When she decided to attend Clearwater Academy in Fall 2017, Myra's mother questioned how she would survive and take care of her daughter without any money. But she didn't quit her job: "I just went way, way down in my job. I don't work that much." During her time at Clearwater Academy, Myra said she took "a big, big financial cut in my life," just making $400 every two weeks. These three Black women had some financial support, but even then, they wondered what their breaking point was before addressing their poverty mattered more than learning computer programming.

Mental health also played a significant role in their context of struggle before coming to Clearwater Academy. The computer code bootcamp could add more weight to those burdens. Pierre disclosed to me that he had been diagnosed with severe depression. Stressful events in his life and the lives of his family members triggered depressive moods. "Yeah, just like that, financial stuff, not having the lights, girl stuff, exes, new girlfriends, yeah. I can't … Lots of drama. Lots and lots of drama," he said. Microaggressions with his landlord was the most recent drama added to his life. During our interview, Pierre had to stop and take a phone call. He later returned and said a fuse had tripped in his apartment. But the apartment complex needed to get a lawyer involved in addition to hiring an electrician. He could understand how race played into this problem at home: "Dude, if I was rich and white, this would've been fixed a long time ago." Pierre is mixed-raced—his mother is Black, and his father is Irish—but he's often encountered racism and racial microaggression in a way that he associated with being perceived as Black, not racially and ethnically mixed. The problem, he said, is his skin. "I literally, the place I live in right now, I deal with it every day … And I've talked to my general manager, and every time I go to shake his hand he says, 'It's nice to finally meet you.' And I'm like, 'Why do you not remember me? Why am I an afterthought?'" Pierre reasoned again that a blond, blue-eyed white woman would get better treatment to resolve the fuse problem and probably affix herself in the landlord's memory easily. But not all participants linked depression and stress with microaggressions. Zelda had anxiety and depression, and they hampered her willingness to go to class every day. "Because I suffer from depression sometimes, so sometimes I don't get out of bed and sometimes I don't sleep because I have real bad anxiety," she admitted to me. Continuing coding at home was just as hard because Zelda would get, in her words, "lazy" and start watching Netflix. Yet Clearwater Academy's structure

and her own goals motivated Zelda to go to class. The easiest part of all, she said, was simply getting to the camp each morning.

The hardship of life coincided with the hardship of learning computer programming. I've already referenced on two occasions Zeus' observation that computer programming – HTML, CSS, and JavaScript in this case – is an alien language. But it helps to give more concrete examples for what's at stake and then understand what participants do to stay on top of their computer programming when they leave Clearwater Academy at the end of each day. Participants could easily navigate the employability skills, often to some annoyance for the lesson's repetition (see Chapter 4). But the exercises in FreeCodeCamp, and completing coding in Wordpress, was an emotional and mental drain. DeAndre remembered just sitting in class when suddenly he was hit with a bad anxiety attack; he excluded himself from class to hide the physical reaction. I asked him what the attack was over. It was his thoughts: "Cause at that time I was scared to fail or some shit. Like, everything hit me, I was behind, and I couldn't get shit done. I couldn't remember HTML. … And then my thoughts were like, Boom! 'You gonna fail, nigga. You gonna fail. You gonna lose everything then.'" The anxiety attack didn't make sense to him; DeAndre was already halfway through the program, and he had plenty of success with learning HTML on FreeCodeCamp.

And Alice said she was trying to read about JavaScript in *Eloquent JavaScript* by Marijn Haverbeke (2018), a book required in the class but not read often. With FreeCodeCamp Alice had done JavaScript lessons repeatedly to try to understand its concepts, so the book was supplementary to making sense of what she was doing. Rosie assessed her success with FreeCodeCamp based on how often she needed to use online tutorials, too. Every now and then she was fine, "but for the last four or five [challenges] I've needed it [online tutorials] each time and I'm like still not getting it." Early on in this section of the program, Rosie could do simple arithmetic with JavaScript "but now they're getting into an area where I don't know what they're talking about. Say, 'What? Who?'" Rania, learning coding in Fall 2017, liked using Richard's suggestion that they copy and paste existing coding from other websites into their project, but she found that some code would still not work, and she needed to go in and modify the lines of code. Like Rosie, she wanted more direct instruction from either Richard or one of the volunteer tutors that visited once a week. But it could be hard to make those connections. Rania thought Clearwater Academy was going at a breakneck speed, so she couldn't even pause to listen to God for direction in a quiet space. "I keep going, going, going, I haven't even had the chance to really focus and be quiet. … Just going boom, boom, boom. Homework, homework, homework. Study, study, study. Project, project, project." The best bet to success in this intensive program?

"You have to definitely go home and just trial and error," Rania advised me. "Try it do it try it do it. Stuff like that. That's the way you gonna get it." From these examples, I could understand how on paper (the advertising, the syllabus, the website) Clearwater Academy required 36 – 40 hours of class time; but the program's intensive curricula followed adult learners into their homes, requiring more hours of coding practice than they had first thought.

From my observation notes and interviews, I concluded that most participants in my study graduate from Clearwater Academy partly because they strategically made time for the difficulties of coding outside of class. Often this came at the expense of family and sleep. Take, for example, Myra, who said her "coding pattern" was so different from everyone else in her fall 2017 class:

> Because I didn't get enough study time like everybody else. When I leave, this [brain] shuts off. Now I got to go home and get my family together. My studying habits is different from everybody else. I would do homework at 7 o'clock in the morning while everybody still asleep. Five o'clock in the morning. Doing FreeCodeCamp while everybody else is still asleep because when she [her daughter] gets up, my brain shuts off on that mode. I have to try something else. And I would ask my classmates for a lot of notes. So I would read a lot of notes; and I would read them on my phone while I'm in bed. Yeah, studying pattern is crazy than everybody else.

Myra described coding as an embodied and cognitive literacy practice. For her, coding was an off and on switch as she balanced expectations of Clearwater Academy with the expectations of family. Shutting the brain off when she left the computer code bootcamp and then turning her brain back on when it was time to code for a couple hours, a light bulb that goes off immediately. The metaphor suggests that coding happened suddenly and in short bursts for Myra. To supplement what she missed in those very early hours of the day, Myra switched to class notes—a burst of electricity while her brain was stuck on learning how to labor with computer programming at Clearwater Academy.

Alice was also a mother. She was grateful for a quiet, stable household, which was essential for focusing on coding in Clearwater and at home. Her daughters did their homework and seemed to follow the rules at school; her partner looked out for them when she was either at class for Journey or busy with FreeCodeCamp. Even then, Alice understood the sacrifices she was making, especially time spent with her children. She wouldn't get home until 6 p.m., and when she did, Alice had to cook dinner, eat dinner, and help her daughters with finishing their homework before taking their baths. "And then

it's time for bed," said Alice. "It goes really fast, and I don't see them a ton. And then it … usually once they go to bed, I have time to be myself and work." Alice would then start coding. Sometimes she worked until midnight. Other nights she would go to bed at 10:30 p.m. "I usually can't stay up too, too long because I have to do it all over again and be up by 6:30. Then I just … I don't like being tired and groggy and feeling like, you know, the next day and I try to get enough sleep because then I feel like I don't have a whole lot of time outside of class to work on projects and in FreeCodeCamp. It's really just trying to find a balance. It's tricky." When to work on coding and for how long before letting the body sleep? Alice wanted to balance family with the need to work through computer programming exercises. She couldn't spend too much time on either, however. Containing time with her children within a few hours can be tiring, so she needed the energy to sit up and read about JavaScript or tackle the computer programming itself. But if she stayed up too late, she wouldn't be prepared for neither family nor Clearwater Academy. Hence, laboring at Clearwater Academy while doing carework for her children was *tricky* across all dimensions of her life.

Pausing coding for family wasn't the responsibility of only mothers. Black men like Isaiah had to strategically note when to learn coding and when to look out for family. A month before the program began in February 2017, Isaiah learned he would be father to a baby boy in September. Quality time was all his girlfriend required of him, but that was often negotiated—when to see a movie together and when to stay home and work. However, Isaiah's nephews had no concept of boundaries when they visited his mother each weekend. He was an uncle to four children: an eleven-year-old, a ten-year-old, an eight-year-old, and a two-year-old. The two-year-old "sticks to me like glue" but "likes to throw things. And most definitely not going to let that happen to my laptop." Sometimes he could coax the nephews into doing something else or get a little help from his mother to look after them. Isaiah would then have space to figure out coding and work on projects for Clearwater Academy. But most often he had to wait: "So when it comes to that I'm kinda like coding at night, or working on my stuff when they're not there," explained Isaiah. "When they first got here last weekend, on Sunday they left. So I spent the majority of the time working on my personal website." Isaiah sometimes worried that he just couldn't get coding or understand how to make it work for him, so finding space between himself and family was important to his success in Clearwater Academy.

The introduction of a computer code bootcamp into lives already oppressed or stressed not only restructures mental health and family life, but also simply taking care of yourself and your personal space. Recall that Rania was so stuck on "project, project, project" and "study, study, study" that she couldn't pause to go into her quiet place and listen to God. While her spiritual

life was in flux from coding, her body and personal space was also in flux. In August 2017, Rania had just moved into a new apartment, but she had no time to set up the new place because she had to attend classes. "My air mattress busted so I'm sleeping on the floor. You definitely don't get a full night's sleep," she explained, giving me a mental image of her living conditions. Well into the program at the time of our interview, Rania "still haven't unpacked. It's still like things I need to get done." The intensity of Clearwater Academy required her to decide mentally and emotionally what in her personal life needed attention and what could be put off. She explained that overcoming the challenge of coding requires "just doing it" but with procrastination. Rania had previous experience working with Wordpress.com, for example, but not Wordpress.org, a service that traded premiums for more coding features. But when she hadn't taken the time to learn it, she felt an "uneasiness" and a need to "go ahead and do it. … Something else is going to have to be put on hold. And so that's what I'm working right now; what's going to be put on hold." That's just the way it is when she must learn computer programming on her own: "Because when you teaching yourself you got to say, 'Okay. This got to be on the backburner. I'm gonna have to dedicate all of this time for this.'" It's the only way to stay in Clearwater Academy and achieve social mobility through computer programming.

Clearwater Academy restructures everyone's life in different ways. The examples above tell a story of adaptation that keeps up with coding, family life, and work, but Rosie (see Figure 2.2) remains an outlier. Her life is the penultimate way of adapting to a computer code bootcamp curriculum. When I asked her about her networks of support, Rosie took that to mean "before I started the class the things I needed to put in place that would take care of the obligations that I had prior to the class. So I guess that's my support I guess." Rosie had just taken early retirement after being diagnosed with lupus; her main responsibilities now was caretaker and health advocate for her mother and her older brother who had stage four esophageal cancer. With Clearwater Academy now in her life, Rosie needed help getting them to their doctor's appointments. She used to drive her brother to a cancer clinic for treatment every two weeks, but with his blood work looking better, the doctors moved him from IV treatment to receiving chemotherapy through a bulb in his stomach; that lessened the appointments for Rosie, which was "a real blessing, a load off of my mind, too." For her mother, Rosie convinced one of her sisters to move into the same building as their mother back in December. Then her sister could check on their mother, even though Rosie herself lived a five minutes' drive away. They split responsibilities between one another: her sister helped with "in-house daily cleaning, cooking, whatever" while Rosie "help[ed] with doctor's appointments, grocery shopping, transportation-type things."

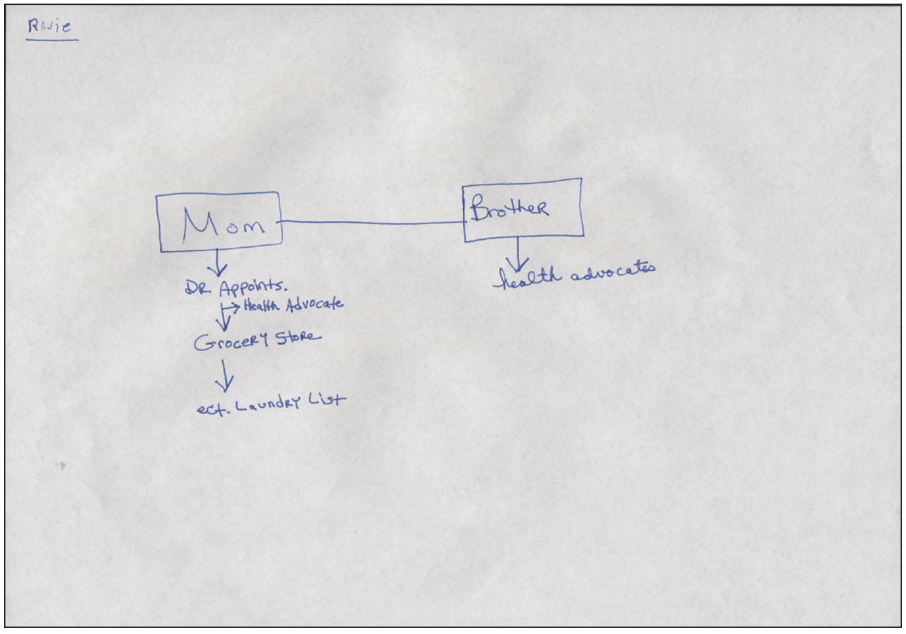

Figure 2.2. Image of Rosie's network map

Rosie recalled missing only one class at Clearwater Academy because the doctor had to reschedule an appointment for Monday. An appointment is never just an appointment for Rosie's mother; it usually turns into an outing to other places like visiting the zoo or the arts and cultural center in town. "And so that's how I supported myself, I guess, in that way," explained Rosie, "so I can be here without … for a few months." Everything else remained in place; the only change is that Rosie had to be mindful of her finances. Budgeting was key, especially with driving to and from Clearwater each day. So, while other Black adult learners had to navigate the tricky and risky work of adapting to Clearwater Academy, Rosie set up guardrails to stay in the computer code bootcamp so she wouldn't worry about her mother and brother. She herself may not have the same measure of responsibilities or racial inequality as other adult learners, but she did have to manage the inequality of her family members. Because of common health disparities for Black people, Rosie needed to be a consistent health advocate for her family. If she became a fulltime health advocate, Rosie could no longer keep up with becoming a Black coder.

In this section of the chapter, I step back to consider multiple hardships or difficulties Black adult learners bring with them to Clearwater Academy. Black adult learners contend with unlivable wages, mental health issues, racial microaggressions, and family obligations. Clearwater Academy has institutional influence on the lives of Black coders; its 36 – 40 hours a week demand

that they learn how to translate solutions in English into viable bits of code in their spare time, which forces adaption, a re-restructuring of their lives. But most significant in these pages is that Black coders do this adaptation *on their own*. Given that they must practice code while dealing with the consequences of racial inequality, not all can succeed independently. Although they figure out how to fit all the puzzle pieces of life together, they may falter. They may leave themselves more vulnerable to new social challenges even as they try to learn coding to deal with those challenges. This broad context informs participants' definitions of and unconscious hustle for community-based care.

Philosophies for Care in a Computer Code Bootcamp

In this section, I explain participants' beliefs about how to create a community of care within Clearwater Academy, and how to repair and maintain the web of relationships created in the computer code bootcamp. Instructors Richard and Jessica called Clearwater Academy a worksite yet my discussions with Black adult learners over their network maps suggested they had found the anti-thesis of learning coding for capitalism: valuing human beings for being human, especially marginalized humans, and not always as potential coding literate subjects for the tech economy. These beliefs about what makes a community of care in a computer code bootcamp developed as participants experienced the training, not before or after. As I analyzed the interviews and my observation notes, I couldn't help but think these definitions were slowly emerging for Black adult learners in Clearwater Academy. I first reflect on *what care is not*, especially from Clearwater Academy. Then I outline four significant beliefs about communities of care, how to build them, and how to maintain them.

Ubuntu: Not an Obligation, Not Family. It's Grandma.

I want to pause my reporting and analysis here to give my meta-reflection on how I came to define care in the context of a computer code bootcamp. This subsection is a foundation to help readers, and honestly myself as the writer, make distinctions among carework and obligations moving forward. Clearwater Academy is one of many programs that furthers SJC's goals to combat racism and poverty. As a nonprofit, SJC can provide social resources to adult learners attending Clearwater Academy. Richard and Jessica knew who they are teaching, so these resources must be a daily option to support low-income women and people of color. I've mentioned one of those services while describing Halima's story: housing assistance. Alex, a adult learner from the spring 2017 class, was homeless for a month but went to Jessica for help.

They supplied one month's rent and the security deposit. The rest of the lease was up to Alex to pay. Other services included gas cards, bus passes, and recommendation letters to receive Section 8. Alice wrote a scholarship essay to receive $1,000 from SJC to help pay her electric bill and other necessities. As I analyzed interviews and observation notes, focusing on definitions of care in a computer code bootcamp, I had trouble separating care from social services, or, to put it more bluntly, separating care from "that's just their job." As a researcher, you get deep into the weeds of language, emotion, belief, and motivation. Listening to marginalized voices that I shared affinity with, I found it difficult at times to say for sure that an action was care. "Surely," I thought, "*everything* can't be care."

My interview with DeAndre (see Figure 2.3), however, provided a clearer perspective on how to make sense of what was happening in Clearwater Academy. Incidentally, he referenced life outside of the computer code bootcamp to help me think through carework and obligation. Studying his map, I asked DeAndre if there were any other kinds of support he needed to succeed in Clearwater Academy, such as working as a pizza maker to pay bills. DeAndre replied, "That's not support, that's an obligation … That right there, that job supporting my house, supporting my bills. If I don't have that I feel obligation to go to that job when I fail. That's an obligation. Me getting money is an obligation, too." Work. Make money. Have a good future for future children. They were "all an obligation to myself. I only have one, which is me. I'm the only obligation that I have right now." But when I read that he had written "Grandma" on the page, I asked if she was an obligation. That's when DeAndre began making distinctions: "It's not an obligation, it's grandma." I kept thinking of the difference between obligation and responsibility to family as one and the same. Oh, so that's family, I thought. DeAndre clarified further: No, that's *not family*. "That's my grandma," he said. Family "can't ask me what she ask me," like calling DeAndre to take the trash out at 7 o'clock at night because her hip hurts.

DeAndre considered "obligation" and grandma two different things. Obligation, using the typical definition of the word, means fulfilling expectations because there's a social contract to fulfill. He must work and make money to contractually pay bills; he must save money and further his career using Clearwater Academy to complete a social contract to his future children. I thought obligation also meant fulfilling loyalties to family, but DeAndre made his grandma standalone, a person separate from family. Grandma is the person, she herself matters to him not out of some social contract but because of *who she is* and, I would add, *what she's going through*—like in the case of taking out the garbage, her hurt hip. This kind of relationship, I would argue, comes by way of lived experience, not relationships already made for

you when you're born into the world, such as having a sibling, aunts, uncles, etc., the family you cannot choose. For example, DeAndre counted Grandma as grandma and family as family, because other family members treated him poorly when he still lived in Chicago: "when I was down, I rarely got help. It was either getting kicked even more or I was getting put down. There was no in-between. No help. No support. You weren't doing good, get ready for insults. Just know they going to talk about your ass. In your face." As we will later read, DeAndre's grandma treated him differently.

I adapted his perspective on what's obligation, what's carework, why carework happens in Clearwater Academy, and how communities of care should be central to computer code bootcamps in ways that identify and interrogates social oppressions. More important, DeAndre also reminded me of ubuntu, which is often translated into English as "I am because we are." This African philosophy emphasizes a universal connection among all human beings and with their spiritual and natural environment. The philosophy also recognizes that "a person makes sense of who they are in relation to others" (Browdy & Milu, 2022, p. 236). Both your humanity and who you are affirmed, and because of who you are, and your relationship with others, care and respect must be the response. When DeAndre does carework for his grandmother, then, it is because of her humanity, because she simply is grandma. Interestingly, in computer science Ubuntu is a Linux open-source desktop software. Developers created the program after being inspired by the African philosophy's emphasis on sharing to guide the open-source movement: share with no required payment or restrictions on how to modify and design the code (Lockett, 2012). Yet ubuntu itself is missing from cultures of code. The overlap between Black feminist caring (doing carework from knowledge of and experience with oppression) and ubuntu reinvents how these cultures protect and honor race, gender, and sexuality in relationships and technology design (Mhonde & Hingle, 2021). Grounded in DeAndre's own perspective on relationality, coupled with Black feminist caring and ubuntu, I forge ahead with how participants defined communities of care in Clearwater Academy and then offer examples of specific actions that support their learning computer programming.

During our interviews about their network maps, participants often expressed expectations of what counts as care or what would be valuable to maintaining their web of relationships in Clearwater Academy. These interviews occurred later in the semester, so everyone spoke from having experienced Richard and Jessica's teaching, learning coding through mini projects on Wordpress and activities on FreeCodeCamp, interacting with volunteer tutors, attending Meetups, touring local tech companies, collaborating on numerous projects, and forming bonds (or not) during breaks, lunch, and outside Clearwater Academy.

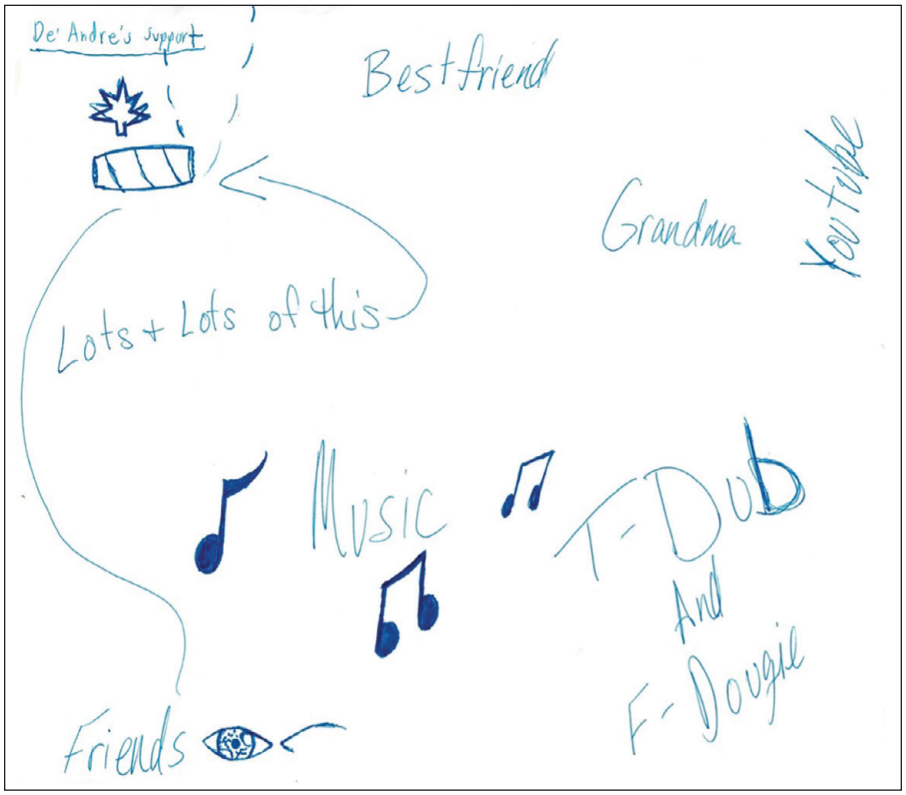

Figure 2.3. DeAndre's network map

What Maintains the Web of Relationships in Clearwater Academy

The first belief is that working on code in communal networks of care leads to success for all adult learners. Over several weeks in Clearwater Academy, some participants noticed that other actions supported their laboring for the computer code bootcamp. I could tell there was a change in participants' expectations from when they first started Clearwater Academy as they began to make sense of the curriculum and the computer code bootcamp's philosophy. A couple participants thought Clearwater Academy wasn't supposed to be more than learning coding and job training. While reflecting over her network map, Myra thought Clearwater Academy was just "something you did and got over with." Pierre also assumed as much, focusing on learning a new skill for social mobility, something to take him further in life, but he admitted in his network map interview that "you start to really care" for your classmates and "I didn't intend on that." Clearwater's instructors created a curriculum that allowed multiple access points to carework.

Zeus noticed connections among instructors, coding literacy instruction, and emphasis on proper, ethical behavior. Referring to his map, Zeus pointed at the Timber Wolf in the center of the image (see Figure 2.1). Originally it represented himself but later in the interview he revised that interpretation. "Let's say this figure here doesn't represent me but the content," explained Zeus. "And the content includes proper behavior because they teach us that … They taught us ethics and principles. That's part of the class." He ideated further the consequences of not modeling and teaching ethical thinking: "if the student isn't following the content, then the class fails altogether because everyone has an influence on each other." Clearwater intended to align the practice of coding with values and beliefs that positioned their adult learners on firm moral ground, and that would make them better coders. Kevin learned this idea from Richard when discussing the limits of whiteboard interviews—interviews in which a job applicant for a software developer position solves a coding problem on the fly using dry erase markers and a whiteboard. Describing the lesson, Kevin said that in certain situations the applicant "is a genius but he's kind of a dick. And this guy isn't a genius, but he gets along with everybody. This guy is going to get hired. And it's kind of a flip but as far as whiteboards go it doesn't really show." Zeus hinted at the importance of interpersonal relationships when he noted that "everyone has an influence on each other."

The difference between Kevin's lesson about whiteboard interviews and Zeus' own observation about Clearwater Academy's curriculum was that the first maintained a professional community while the other focused on proper behavior to recognize and support adult learners' humanity. I unpack further the difficult line between ethical behavior to maintain communal networks in cultures of code with ethical behavior to uphold the whiteness within cultures of code in Chapter 3. Here I want to establish that, as Zeus and others observe, Clearwater Academy instituted carework as a bedrock for the class itself, and it had downstream effects on the entire web of relationships throughout both cohorts.

While the first philosophy of care from Clearwater Academy is working on code in communal networks of care, the second belief is expecting everyone to take responsibility for their own behavior and striving towards greatness. Pierre felt valued in Clearwater Academy, and he extended that empathy to other classmates, or at least he had hoped he was doing carework well. "I don't even know if I'm valued to them," he thought, "but I like try and communicate with most members of the class. At least participate during all of our activities. I don't talk down to people and such but that kind of thing …" He himself experienced the opposite of this philosophical belief while collaborating with two other classmates on a major project. They designed a website

that listed kid-friendly events for parents looking for something to do with their children at the last minute. Richard assigned the project manager role to Sean, a white man who used a powerchair. Meanwhile Pierre and another classmate worked as the software developers and interactive designers. The power dynamics disrupted multiple opportunities to share care in a challenging training environment.

Pierre thought Slack was a useful digital space for finding resources and advice on coding and job training. However, he avoided Slack about halfway through the program because Sean—the project manager—would constantly nag Pierre in private messages, or he would post messages on the class Slack channel that blamed Pierre for supposedly not doing his part. "I really like Slack," Pierre said, "but this project has made me avoid it like the Black Plague. I open up my computer and I have—he's always trying to teach me something, but he doesn't know how to do it himself." Case in point: Sean volunteered to research on how to import information about children's events into an RSS (Really Simple Syndication) feed on the calendar website. Meanwhile, Pierre researched how to design and code the actual calendar. A month passed, and between individual projects and employability training, Sean had done nothing. Pierre himself had to figure out how to pull all RSS feeds about children's events from different websites. But he soon ran into another snag: they could pull in dates for events, but they had no way to organize the dates on the website. Sean offered to help: "He wanted me to get this plug-in that would organize that for me, but it would put it in a list form. … So he sent me this code to put in and it crashed the whole thing. And he was like, 'Do you know where you saved your stuff?' And I'm like, 'Yes I know where I saved my stuff.' 'Why are you raising your voice?' There's so many little nuances with that." The frustration came from doing twice the work, as Pierre suspected he would be on his own for the group project. So that he would not fail and "fuck myself," Pierre created a separate calendar website. "I have to do it. I have to learn it for myself, because I have to do it again," he said. "I have to do--like I have to turn in two of my own… but I thought he'd be able to help me at least figure out the RSS feeds for the calendar because he said he'd research it a month ago. He can't. It's like the one fucking thing. The one thing but you're out here making me look crazy."

Reflecting on this class project, Pierre wanted basic human decency from Sean that could lead to care. For example, the other classmate they worked with was mostly absent and unresponsive to Slack messages. Pierre understood. She had eleven kids. But Sean "wants to be pressing her and I'm like, 'Leave her alone. This is something we can handle. We can show her how to do this and if she doesn't want to learn, that's not on you. She has a life. Don't push someone to the edge." Pierre desired more empathy

from Sean and more gratitude for himself. After all, Pierre wasn't just a classmate; he was also a caretaker when Sean's nursing assistant was absent, fixing "this man's suspenders, I grab his chair, I do so much for him now that I've been in this group project—I should be getting paid for it." Pierre outlined simple actions that could make learning computer programming significantly better: "All I care about is that you say 'Please' and 'Thank you,' and treat others the way you want to be treated." He noted that he wasn't trying to disparage Sean for his disability; Pierre delicately asked for a reciprocal relationship, not an "investment of losses and gains"; care "is not a resource that owners 'deposit' or 'withdraw' at will (Douglas et al., 2017, p. 2). The request flips the script on the value of independence and re-centers Pierre as a caregiver. And he leans into and wishes Sean could be invited into the interdependence of carework so characteristic of Black communities (Bailey & Mobley, 2019).

Taking personal responsibility for one's own actions further promotes coding literacy as a community-based practiced. Belief in the goodness of other people and yourself drives that value. To extend this part of the philosophy of care, Alex explained in specific language why faith in humanity becomes essential for being in Clearwater Academy and life in general. During his network map interview, Alex (see Figure 2.4) pointed to Faith as foundational for getting through the computer code bootcamp. "There's this very odd kind of a dichotomy between how bad people are and the potential that they have and can possibly rise to," explained Alex. "My faith comes from the fact that I know that people suck but nothing can stay the same forever." Building on this point, Alex thought the solution to sucking less was self-awareness of how you can suck, something reminiscent of Pierre's request for care from Sean. A "shitty human," in the words of Alex, "invalidate[s] or … demand[s] an explanation of understanding your feelings which you can't possibly put forward. That is me being a shitty human. And that is me succumbing to the human condition. My selfishness, my arrogance …" The self-awareness of how much a person sucks helps them control how much they suck. Some of that awareness can come by way of the communal network calling your behavior into conversation. To not render care when it's needed for everyone in the computer code bootcamp, makes someone an awful person. One can't make people code and code cannot show care. An instructor, using Alex's logic, can become an awful person, and their adult learners fail the program. They can code well but their well-being in an oppressive state must be given. We will find out how Richard and Jessica sometimes help Black adult learners rethink their self-image based on regularly one-on-one performance reviews later in this chapter, so they "suck less."

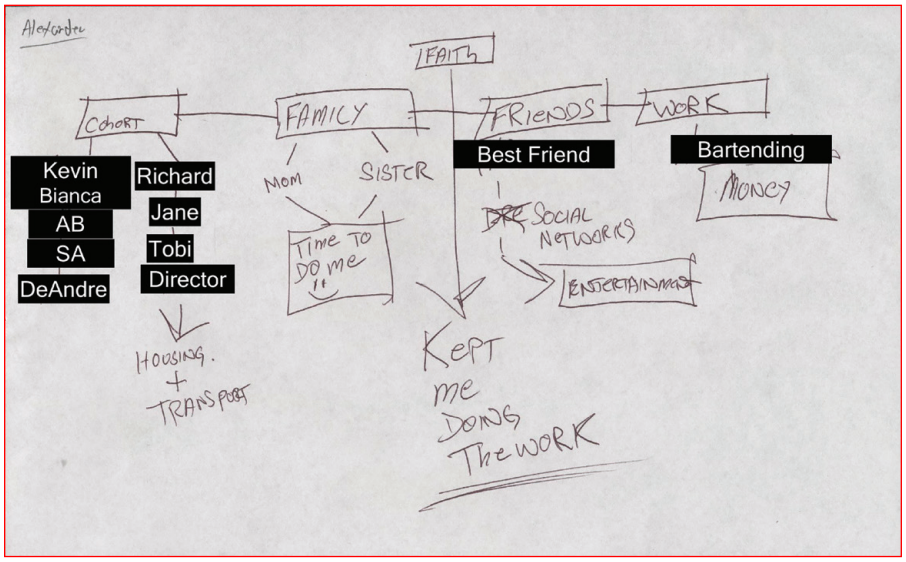

Figure 2.4. Image of Alex's network map

Refusing to cause trouble is a third element in participants' philosophy of care that helped maintain their web of relationships in Clearwater Academy. Here Black adult learners have the option to call out classmates or even the instructors to make their work in the computer code bootcamp easier. However, participants recognize this may cause so much friction in their relationships that ultimately complaining to higher authorities isn't worth the trouble. On her network map Rania (see Figure 2.5) wrote "My sister, friend" and the name of the person. The kind of help Rania received from this friend seemed simple at first: when Rania went to church each Sunday, she would just say hello to her friend and give her a hug. Almost immediately, Rania clarified that this "friend" was the CEO of SJC, Richard and Jessica's boss. And what's more Rania knew the CEO's mother. Rania didn't want to tell me at first that she knew the CEO's mother through another member of the Delta Sigma Theta Sorority. This member introduced the two of them when Rania was still going through domestic violence and raising her children as a single parent. "She's been my sister my rock ever since we like this. So she's my big sister. It's like if I need anything I can call her. We do holidays together. Whatever."

Because Rania had deep personal ties with the CEO and the CEO's mother, and saw them so often on Sundays, she could, if she really wanted to, say something about the program to them. Complain that there wasn't enough direct instruction in coding, for example, or hoping for better relationships with the instructor. But Rania didn't find use those connections to her benefit. "But I don't want to put no negative—it is what it is. You see good and you

see bad, and you just deal with it." What she really wanted to do was "just get through the program. I feel like it's a lot of connections that I probably will keep in contact with people because you got that vibe but yeah … I like the network. I like the connection." Rania had the option to make Clearwater Academy better for herself, leverage relationships into more social services, for example, but that would cause a shake up in the web of relationships she formed with her classmates. She guarded her social connections, so she didn't appear arrogant or out for herself. Certainly, Rania could also use her close ties with Clearwater Academy's administration to improve the lives of other adult learners, but she feared losing something vital in the end that would make doing coding post-graduation easier.

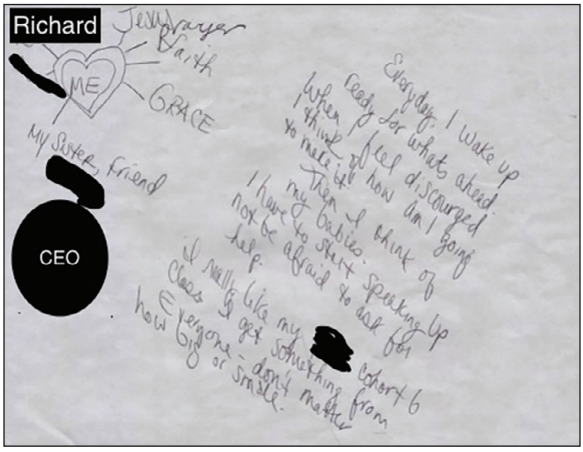

Figure 2.5. Image of Rania's network map

Participants had reason to separate themselves from some classmates so they wouldn't disrupt their coding literacy practice. Kevin had much sympathy for Alex as they were working on a group project for an e-commerce website that sold medium and small recreational drones. Alex was struggling with housing and holding a stable job and was thus not as tuned into the group website. Their team needed a wireframe of the homepage, but Kevin and another team member wondered if Alex could pull through with delivering the design on time. If Alex couldn't balance his life struggles with coding, Kevin and his peer thought about drawing the wireframe themselves and then coding the homepage separately, just in case. Each team member assessed the other's performance at the end of the class in Clearwater Academy; Kevin saw no reason to "throw him [Alex] under the bus. Like be like, 'Well you didn't do his part that's why we don't have anything.' We're a team. And if he can't do it, that's fine." This flavor of refusal to cause trouble is different from Pierre's decision to create a separate website from the original one he designed

with Sean. That was about protecting himself from failing the program. Instead, Kevin and his peer sought to take on extra labor to ease the burden on Alex, and give him space to address life responsibilities that disrupted his own workflow in Clearwater Academy. Kevin acknowledged that Alex needed care, even if Alex most likely wanted to contribute despite his hardships.

Refusing to cause trouble included separating oneself from family members who may cause emotional harm. Alex found that his mother and sister only cared about his work in Clearwater Academy when money was involved. Alex translated "How much money does computer programming make?" to mean "How much money can you share with us?" In discussing his network map, Alex admitted that being away from family and even not talking to them really helped him focus on Clearwater Academy. He described their dynamic as negative and positive charges. "I have a different charge from my family," Alex explained. "And it's not like I don't love them—we got a different charge going on. And so that charge is reactive. And I wouldn't want that to come in the way of the love that I have for my people and the love that they have for me." Like Rania, it was not Alex's intent to break up or make space and distance from the relationships he cared for, but if he closed the distance, the web of relationships would begin to shake, twist, and possibly fall apart. *Lacking* social connection by choice, ironically, ensured his engagement with coding over *severing* a social connection altogether.

Finally, I glean from participants that too much carework can be detrimental to themselves. This philosophical belief overlaps with the ethics of care principle that operating in your relationships requires you tend to your own self-worth. Sacrificing yourself too much to uplift others against their own oppression is *oppression against the self*. Myra's familial responsibilities before Clearwater Academy followed her into the computer code bootcamp. The program became a mental space where she could learn many life lessons, including how to protect herself against the needs of her siblings. Myra's mother was a single parent and often absent, so she was left to take care of her brothers and sisters. Her taking on motherhood at a young age made Myra "grow up faster than I was supposed to. … I was too busy making room for everybody else." That life continued well into adulthood. For example, her brother was an entertainer; Myra always went to his concerts. Another sister earned two college degrees; Myra attended both graduations. Her other sister wanted to work in construction; Myra had a spare bed for her while she finished vocational classes. Even though another brother bounced around the East and West coasts, Myra offered to help financially. And when another brother had two strokes and two heart attacks, "I was there." Myra supporting her siblings would derail her chances to start Clearwater Academy early. She had been talking to Jessica about learning computer programming for two

years before finally attending in 2017. Each time Myra planned to start the program, she pulled back and put off Clearwater Academy for another semester and another semester. "I refused to stop putting myself first," Myra said. "Just doing what everybody else was doing." Myra could have started a career in tech a long time ago, or at least leverage those skills into a more lucrative job and with better hours. But she paused potential upward social mobility for more carework than what was perhaps necessary.

While Myra took two years, and perhaps her entire life, to finally prioritize her self-worth, DeAndre wasted no time in putting himself at the center of his web of relationships. Early in the spring semester program, Alex, you may remember, lost his apartment after a landlord demanded that he pay six months' worth of rent. DeAndre offered his couch to help Alex. At the time we spoke, Alex had been living with DeAndre for a week, but already he was having problem with him. A good friend, DeAndre thought, but not a good person to live with, because he was "a little bit too lazy—he leaves shit everywhere." DeAndre worried that Alex's behavior—leaving a soda bottle unopened, leaving split sugar all over the kitchen counter attracting ants—would influence his roommate, who had just started to learn—in subtle ways, DeAndre said—to clean up after himself. DeAndre didn't want to see his roommate backslide on cleaning because of Alex. One morning DeAndre tried to wake up Alex four times so he could show up at Clearwater Academy on time. He never woke up and was thus late to class that morning. DeAndre felt bad at first. But then he thought about his grandmother who had sleep apnea. She said that Alex was an adult who should be up and ready go to class on the second try. That assuaged DeAndre's worries. DeAndre wanted to help Alex until he got a new place, but he also worried that he was caring too much. "It's not going to get me anywhere," DeAndre thought. "It's not going to get him anywhere." DeAndre suspected that Alex had too many enablers (family and friends), and he was one of them. DeAndre figured that if he helped too much, Alex "won't ever learn to support himself if he still has all these things that he can just fall back on whenever he fuck up." He talked about the issue with his grandmother, and she suggested DeAndre kick Alex out. But by then, Alex had found a place and rent assistance through Clearwater Academy. From these lived experiences providing carework, participants understand the limits of their communal networks on themselves and the consequences that may occur on their relationships as they attempt to learn coding literacy together.

The sociocultural dynamics of a community have a significant impact on coding literacy practices. Black adult learners value their web of relationships as much as coding literacy, and at times attach those relationships to working on code or employability skills. Carework eases the burden of learning computer programming under the burdens of oppression. Macro-level forces

that derail their attempts at learning coding literacy requires knowledgeable, empathetic responses from instructors, peers, and others around them. A communal network of care, a strong web of relationships throughout the program can go a long way. Suddenly, in the words of Pierre, their difficulties don't matter compared to the opportunities of what coding literacy can do in their lives. Labor in Clearwater Academy should be a communal experience in learning how to establish relationships, not for work. That could pave the way for learning computer programming collectively. Care is needed for collective success. Their philosophies of care shape the actions they take in and outside of Clearwater Academy. In the final section of this chapter, I outline three such actions that seemed to be consistently valuable across network map interviews and in my own participant observations. These actions serve as examples of what happens when carework becomes a part of cultures of code in a computer code bootcamp.

Ways of Delivering Care for Coding Literacy

In the previous section, I explained how some participants shared expectations of how a community of care should work in a computer code bootcamp. In this final section before the conclusion, I describe three specific practices of care that Black participants delivered to each other, from instructors to adult learners, and from family and friends to adult learners. Based on my analysis of network map interviews and some field notes, I discover three moves that added to the culture of code in Clearwater Academy: (1) Listening for Oppression and (2) Offering a Word of Wisdom and Accountability, which inspired some adults to revise their self-image, a result I call (3) Holistic Transformation of Self. Actions like these show that someone cares about their existence in a racist world, that someone recognizes Black adult learners as more than workers-in-training that benefit the economy and tech companies.

Listening for Oppression

Building trust with one another begins with learning how oppression works in others' lives, which motivates delivering carework in Clearwater Academy. Learning requires *listening for oppression*. I had not understood the value of listening until I spoke with Pierre about his network map. My conversation revealed how listening is a double-edged sword. Delivering care can look disingenuous or look like a suspicious ploy to get something that benefits the caregiver over the Black coder. Even though I shared some affinity with other Black people in coding, my positionality was still rooted in my educational and class privilege—a graduate student who came from a middle-class

family—my parents lived in poverty, but they worked to ensure my two older siblings and I did not—attending a prestigious internationally known university. When I spoke with Richard and Jessica, and some other adult learners, they occasionally read me as a student. Richard and Jessica asked me if I got everything I needed for my research; adult learners were excited that I would graduate with my doctoral degree thanks to their generosity.

However, Pierre scrutinized my presence beyond just being a graduate student. He wondered if I truly listened and cared for their challenges and triumphs as people, and not as study subjects. When we first met in fall 2017, Pierre thought, "Oh you just want a PhD, man." But during our meeting later in the semester, I was surprised that he included me as one of his sources of support on his network map. Pierre drew a small fried chicken leg next to "instructors," recalling the time I gave him money to buy lunch from a fried chicken restaurant down the street. What I thought to be gestures too small to make a huge difference, like giving him lunch money, Pierre took as a sign of genuine generosity. For all his life, no one "asked what's your experience in something that you're doing as an African American person," Pierre told me. He had gotten a lot of grief from racism and racial microaggressions. He wanted to vent with me in ways that he could not with family. He also dealt with depression, and so Pierre felt "like shit more often than not" while learning computer programming. It helped that I was at Clearwater Academy, "listening to us during what we're struggling through, caring about our experiences in the program … seeing someone that I've never met in my life that cares about me and people like myself that means a lot to me."

Zeus was the only other participant who felt my presence made a difference in Clearwater Academy. Our formal interviews, and informal, friendly conversations helped build a strong repertoire. On one hand, our interviews sometimes became a haven for Zeus to share his thoughts and parts of his life openly without judgement. During our literacy history interview, for example, he wanted to make sure I wasn't going to report to Jessica anything he said. On the other hand, our drawing network maps together later in the semester seemed to break down barriers between us. We happened to be chatting on my birthday, and I hadn't told Richard or Jessica. Zeus volunteered to draw me a gift, something that "I would like." He later pointed at his network map and said that the exercise took "a lot of brain and emotional power … just reflecting on this and all this … It's kinda like … yeah." Zeus found the conversations about his network map beneficial because it was "like therapy for me." I'm not a therapist, but for Zeus a therapy session was happening, in which one person listened with the intent to understand another person in the context of cross-cultural communication (Ratcliffe, 2005). To listen for oppression is to listen with care. Pierre

and Zeus acknowledged that I belonged within their web of relationships at Clearwater Academy.

As mentioned in the Introduction, I offered my skills as a writing instructor to help with résumés, cover letters, elevator pitches, blog posts, and even some efforts to decipher directions on coding exercises. That was an obligation *and* carework, as I knew that researchers visiting marginalized communities can take what they need and do little to give back or amplify participants' voices. But my positionality seemed to address their histories of never receiving carework from school or work. Listening for oppression stoked the motivations of learning coding, to undo histories of never finishing or doing well in life. Here I participated in adult learners' learning with significant consequences on their literate lives and literate activities. Interviews, participant observation, and volunteering my pedagogical expertise became an access point to care in Clearwater Academy.

Clearwater Academy used stand up as an access point to listening for oppression, too. Recall that stand up is an opportunity for software engineers and other members of a project team to literally stand up and report on their progress, what they planned to do for the day, and what challenges they need help overcoming. As noted with Halima's story, stand up was a sly yet effective way to build relationships among adult learners. A change in the prompt—from the professional three-part question on projects to subtle personal questions transformed stand up into a valuable tool for Black adult learners. The intent was not to share trauma but to allow adult learners to be vulnerable without judgement. Pierre thought listening to his classmates during stand up clarified his intentions and resolved his own anxieties about the sacrifices he made to learn computer programming. For once, he wasn't alone. It helped to learn, for example, "what other people have going on in their lives. That makes my life so much, like not freaking out and thinking the world is the worse for me because it's not at all." Like Pierre, his classmates had "other needs" but learning coding and employability skills were "a bigger need for them." Stand up sometimes explored those needs: some shared brief yet deeply personal stories about themselves. Sometimes adult learners would cry during stand up. Pierre noticed that no one offered comfort to those peers at that moment—a hug or a tissue—but "we don't forget, and you treat people differently because of that … Like if anything happened to anyone in the class, it would affect me deeply." Using stand ups for personal narratives motivates Black adult learners to connect and help one another; they lead to direct action later in the program and it also develops the philosophies of care described above. Learning about someone else's common lived experience with oppression informs Black adult learners how to navigate cultures of code, which maybe the antithesis of Black feminist caring.

Stand-up can put oppression front and center, but it can also clarify the talents of Black adult learners. In this way, stand up becomes more than an unintentional way to broadcast pain or trauma to others. In fall 2017, the class nominated Myra to give the commencement speech at Clearwater Academy's graduation ceremony. She was floored to be so honored. Myra's classmate and best friend Leslie was excited to hear her speak at graduation, because "it would've been boring" otherwise. But then Myra, recounting the story, corrected herself: "'Well, they wouldn't be boring,'" she recalled Leslie telling her. "'They wouldn't be you.'" Myra approached the task with some reluctance: she had never really shared significant details about herself during stand up, and sometimes Myra felt she didn't say enough to gain so much attention from her peers. But Leslie encouraged her further, giving Myra an outsider's perspective. Leslie always looked forward to hearing what Myra had to say during stand up, and she was certain the commencement speech would make everyone get a little laugh. The class still needed to vote on the speaker, but even then, Myra focused less on her ability to speak and more about herself. She encouraged Leslie to vote for her because of who she was not because Myra could make people laugh. "Pick me because you love me," said Myra.

Although I have highlighted my positionality and stand up as access points for listening for oppression with care, this practice occurred in other ways, especially private conversations, or hangouts with each other during smoke breaks and after class. Black adult learners, and other adult learners in Clearwater, connected with one another in ways I cannot account for in any observation, field note, or network map. Still, stand up has been like therapy to the self in the work of coding literacy and within Clearwater Academy. Listening for oppression builds trust and empathy among Black adult learners, influencing how exactly to go about the work of coding literacy.

Offering a Word of Wisdom and Accountability

If listening for oppression was a key practice for building the web of relationships in Clearwater Academy, listening mattered just as much for the family and friends that Black adult learners went to for help. They reported often in their network map interviews that these relationships outside of the computer code bootcamp offered wisdom and stirred motivations for accountability. These relationships run the gamut from daughters, partners, and friends to even fur babies. Through these familial, platonic, and animal relationships, Black adult learners found ways to persist in their efforts to learn coding while contending with the pressures of economic and racial inequality. Wisdom and accountability enhanced beliefs in coding literacy and its potential opportunities. Consider DeAndre—a major influence on how I understand

obligation and carework in the context of a computer code bootcamp—who relied on wisdom from his grandmother. She wasn't a coder; had no history with coding at all, but she did have plenty of living on Earth, and that experience informed her advice for how DeAndre could navigate life. If he needed professional advice, he would approach someone else, he told me.

But I noticed that life and coding literacy intertwined. DeAndre could make connections between his training and life through conversations with his grandmother. For example, allowing Alex to crash on DeAndre's couch created some strain between them that carried over into their relationship as peers in Clearwater Academy. There was the miscommunication about getting up on time for class. There was also an incident the night before my interview with DeAndre. At around 8 p.m., he and his roommate left to a visit friend for a smoke session; both of his friends had taken ketamine—a tranquilizer meant for putting horses to sleep. They took a safe dose, but it was enough to knock them out for a few hours. It just so happened that Alex arrived at the house around midnight, but DeAndre was in another part of town and could not return until his roommate recovered from the ketamine. DeAndre didn't get home until 3 a.m.. "I felt bad," DeAndre said. "I apologized but … So much I could do, really wasn't my fault. Ever since then, [he] just been looking at me funny. I understand he offended but at least come and talk to me. Don't do that. That's childish. That's very childish." DeAndre's grandmother suggested he kick Alex out of the house to avoid enabling him and because he wasn't cleaning up after himself. But DeAndre had to balance that advice with his relationship with Alex in the computer code bootcamp for the rest of the spring semester. Thankfully, the choice never came, as Clearwater Academy helped Alex pay for his first month's rent for an apartment.

DeAndre also felt accountable to his best friend, a girl he had met through Instagram some time ago. They started off as potential dates, but DeAndre later decided that her jealousy would be a barrier to anything serious. When DeAndre was struck by the aforementioned anxiety attack during class his best friend came through after he returned home. She checked in on him, asking if he was okay and how she could help. DeAndre said he appreciated even that simple gesture. Although he had intense thoughts of failure and possibly dropping out of the program, DeAndre's best friend gave him a reason to stay. After all, just as she went to college, his friend encouraged DeAndre to try Clearwater Academy. "She was like, 'You should go ahead and go. You like the smartest person I know but you a dumbass,'" DeAndre recalled. "I'm like, 'Eh, fuck you.' She's like, 'Why don't you go? You just wasting your life.' 'Okay, you right. I might as well get up and do this shit.'" DeAndre had to look back on how life wasn't going well: he had spent his days finessing pharmacies and making money off those stolen goods. The problem: money flow wasn't steady. DeAndre admitted

that "she was the reason I got up and got started with what I was doing. She has been there for a long time. She has a big influence. We been through a lot of shit together. She a big support system. And I don't even tell her thank you."

DeAndre had panic attacks over failing the program, but Pierre questioned the worth of his time and energy. He was most interested in what he thought was a guaranteed paid internship after graduating from Clearwater Academy. Pierre often complained about the uncertainty, but just in time his family responded with words of wisdom about trusting the process: "Well you should if you put in the effort," they told him. Pierre said, "Yeah! You know what you're right?" His family told him "what to do to succeed and no one likes to be told what to do, but they really want to see me succeed." The advice seems abstract—just put in the effort—but Pierre knew what that meant for him; it meant discipline and patience with learning computer programming, connecting with peers over the work, and being proud of the work done. He got another boost in confidence about the internship from an Uber driver one day; the driver just happened to be a graduate from Clearwater Academy. The driver told Pierre his story: he didn't get an internship right after finishing the program. It took another six months before the driver got a job in tech. Pierre realized that while he wanted a paying job immediately, the realities of the job market, and his own effort, worked together for reaching that goal. "If that doesn't happen that doesn't mean I'll never get an internship," Pierre concluded. "So talking to him was pretty good." His own vision of the future and his relationship with family also made Pierre feel accountable to staying in Clearwater Academy. People like his mother invested emotionally in his well-being, asking how he was doing in the program and giving advice on how to stay the course. Some days he didn't want to make the effort. Should he even go today? "Yeah, I should go," Pierre explained. "I'd let down my family. And they've been supporting me during this."

Alice herself felt like giving up, if not for her mother's weekly phone calls from Colorado. Her mother was like Alice, going to an intensive, fast-paced program for nursing after being out of school for many years. Alice's mother knew what it was like to take a difficult training program like Clearwater Academy. Later in the spring semester, Alice totaled her car in an accident, which made getting to and from Clearwater Academy difficult. She thought about quitting the program, but her mother offered wisdom on sticking with the computer code bootcamp. "She really reminds me of that even though there are times when I want to give up or even though I'm going through this crappy car situation there's got to be something I can do to make it work," Alice explained during our network map interview. "Because if I give up, she's just 'it's all for nothing. You could've taken a job.'" Alice's mother wove together wisdom and accountability at the same time. She highlighted that if

the prestige of coding literacy was for nothing, perhaps Alice could use her existing literacy practice for a good job. Indeed, she had the opportunity to do so after getting laid off; Alice's bank gave her the option to take a new position, but computer programming's call mattered more. The risk was worth it, but giving up made the risk a waste of time, money, and energy. Alice was also accountable to her family who had made changes to their lives for her training and schooling. The grief over coding literacy felt wasted, so the wisdom from family is to find a way out of no way.

Stick with the computer code bootcamp. Stay devoted to the career you can have. Rania found wisdom and accountability from both a friend and God. First, the CEO's mom—the very same from church and the sorority where they met—often steered Rania away from other responsibilities to focus on Clearwater Academy. Any excuse was unacceptable, Rania said. Whenever Rania found a reason to skip class, the CEO's mother would respond, "'No you're going to [Clearwater Academy]. You're going to class! You're going to finish class.' She be the one saying, 'You're going to class.' 'I need to be working on Friday.' 'No, you're going to be doing this.'" After all, Rania's friend encouraged her to sign up for the computer code bootcamp; thus, Rania was accountable to staying and finishing her coding literacy training. But she also found strength and accountability from her faith in God. Rania broke down the spiritual food God gave her in three ways: faith, grace, and forgiveness. Faith "is what's going to keep pushing me. And without faith I would have nothing …" Grace is that undeserved gift of life that flows through Rania every time she wakes up with "strength in my body." When she got discouraged from learning coding literacy, job training, or her own circumstances, Rania thought about God, and then began to feel accountability: "I think about all the things I have to do keep going because I'm my biggest cheerleader." On this part of the interview, Rania began to think of her responsibilities to the web of relationships created in Clearwater Academy. Once she had given herself strength through God, Rania could then share that strength with others "to uplift them. … Encouraging myself so I can uplift somebody else."

The ad hoc networks Black adult learners form to hustle and grind to succeed in a computer code bootcamp offer other forms of support, from materials to time; but familial and platonic relationships circulate emotional support tempered with wisdom. Participants also find that coding literacy has more value because they must be accountable to those relationships.

Holistic Transformation of Self

The relationships formed in Clearwater Academy and the practices of care delivered from participants and networks outside the coding bootcamp

led to significant transformation for themselves. Some thought they would transform into entry-level coders with more value than when they first entered Clearwater Academy. Instead, some participants found clarity on who they were as people. Technical skills instructor Richard and case manager Jessica played a significant role in this revelation. I've already discussed how standups are points of access to carework (listening for oppression); another common workplace practice in some cultures of code are performance reviews. These occurred about every three weeks in Clearwater Academy when Richard and Jessica had one-on-one conversations about how adult learners worked as "employees"; however, they were also assessing their best and worst qualities and how that may or may not disrupt their employability chances and enhance their work as coding literate subjects. Relating these holistic assessments back to the economy made participants think beyond themselves as potential workers and more about how they lived in an oppressive world. In this final subsection, I focus on Zeus. Of all participants, he felt the consequences of Clearwater Academy most acutely in our network map interviews. I detail the lessons he learned about race and racism, the agency coding literacy rewarded to himself, and how he could use his skills to help others.

Zeus was a twenty-four-year-old self-identified "mulatto" who worked part-time as a bouncer and full-time mixed martial arts (MMA) coach at a local gym. Before then he spent some time selling drugs for a gang, and his MMA skills came in handy for this kind of job. Fighting taught Zeus how to dehumanize opponents, to think of them as something to conquer. Although he was "neutral," to use Zeus' word, he could view buyers as just sources for money, not humans with substance use disorders (SUD). He worked and lived with a friend named K-Cuzo who helped Zeus leave town when he got in trouble with rival gangs. He stayed low for some time until the rival gangs lost track of Zeus. Now back in Sakowin, Zeus still associated with K-Cuzo as a friend. Danger lurked around him, however, so K-Cuzo was a good resource for buying a Glock for just fifty bucks. Looking back on that life from the standpoint of a coder in training, Zeus thought he was living in ignorance, that selling drugs was "just a shortcut" to making money. But Zeus took that shortcut because he thought he couldn't be anyone else.

Zeus entered Clearwater Academy feeling Black people, and people of color in general, had no power in the presence of white people. In his life experience, previous counselors were often white and exerted agency over other people of color, including himself. (In fact, one reason he worked as a bouncer was so Zeus could legally shove drunk, affluent white college students out of the bar, getting back at the racist society he lived in.) He saw Jessica the case manager as the more powerful between her and Richard. She ran the show and Richard was, at best, an "Uncle Tom." But then one day an incident

happened that brought clarity to the racial dynamics of Clearwater Academy's instructors and management. As a bouncer, Zeus often worked late nights, making it hard to wake up a few hours later to attend class in the morning. He fell asleep in the middle of class with his mouth open. Jessica yelled at him and reprimanded him in front of the class. Only one adult learner—Myra—spoke up and defended him. "And I was like, 'Don't yell at him. Y'all don't know what he got going on. What he doing or how he getting here,'" Myra explained. The oppression or inequality Zeus fought everyday was exactly the point upper management made to Jessica later. Zeus wasn't present for the conversation, but he guessed that, after being yelled at, the employment services manager—I'll call Dean—spoke with Jessica. Later Dean checked in with Zeus and asked how he was doing. This was the first time he met a Black man that had power over a white person. "[Dean] stepped in [and explained] who he was and that really gave me faith and I was like, 'Oh us minorities can become something.'" With this revelation in mind, Richard looked less like an Uncle Tom.

> **Antonio:** So if he's not the Uncle Tom, who is he?
>
> **Zeus:** He's Morpheus.
>
> **Antonio:** So [Richard] is Morpheus.
>
> **Zeus:** He gave us, I like to say, what's the word … Yeah, because if you're not on a search engine, then you're a slave. If you don't know how to manipulate all …

Zeus caught a glimpse of a person of color having some power over white supremacy. Richard had power over Jessica, a white person, and that made him a powerful mentor. In *The Matrix*, Morpheus, played by Black actor Lawrence Fishburne, reveals to Neo the truth of his reality. That revelation leads Neo to not only free himself from the constraints of the Matrix; it also helps Neo become the Chosen One, a Messiah-like persona destined to free humanity from the tyranny of the Machines. The metaphor of Richard as Morpheus in *The Matrix's* plot maps well onto Zeus' relationship with Clearwater Academy and coding literacy. Richard had revealed a new possibility for Zeus' reality. He can be a powerful person of color, and digital technology makes that possible. Zeus explained that Richard showed him

> If you can't manipulate the Internet then towards your, sort of financial, something that feeds you, gives you work, then you're working for someone else … [Richard] basically gave us: awareness of the Internet and how we can be masters more so; not slaves.

Digital technology, especially coding literacy, offers a pathway to social mobility, to re-create Zeus' reality. Obtaining social mobility is a way to become a master of your life. You can direct resources in ways unavailable to you before. This suggests that Clearwater Academy and coding literacy affirmed Zeus' humanity and position as a person of color in a racist world. They were resources for his lifelong process of achieving social mobility, but that process requires discipline in a world that Zeus is not used to nor thought was possible. Interaction with other people in his network, helped Zeus re-consider his past life as a drug dealer as a learning opportunity. Zeus considered K-Cuzo a positive presence in his life—he wrote in his map that K-Cuzo"reminds me what I shouldn't do." He compared his life before and after Clearwater as "[ascending] from ignorance to education coming here." Zeus began to see himself anew through Richard and Jessica's insights and through the web of relationships formed among his peers (and admittedly myself). At times he could be a space cadet in the Clearwater Academy, and Zeus wondered, "Imagine growing up, how much a space cadet I could've been."

Although Zeus had lost this opportunity from childhood through early adulthood, he had a chance to make real change for himself and others. Classmates helped him understand these possibilities. Dean was an example of how care should be given to people who already deal with the same oppression Clearwater Academy means to address through coding literacy training for work; but Zeus understood why falling asleep while "on the job" reflected poorly on Clearwater Academy and disrespected the hard work of his peers. A close friend and classmate often helped Zeus get an outsider's perspective of himself. Speaking on the incident and Zeus' other behavior at the start of the program, his classmate said "You look stupid. You sound stupid." Zeus simply replaced "stupid" with "You look like a kid" in his mind. He admitted that he regressed at times in Clearwater Academy. But he wanted to be better and do better as the space cadet he saw himself as.

His best example for how to deliver care through authority was from his MMA mentor and owner of the gym where he coached teens and adults. His mentor used to work for another gym. He believed that a gym wasn't just a business; it was a community center, a place to uplift troubled youth through the discipline of martial arts. But the instructor Zeus' mentor worked for overcharged adult learners and put them under contracts that mostly benefited the owner. Zeus' mentor quit and started his own gym that truly benefitted poor adults and teens. Ultimately, Zeus learned about "integrity" from working closely with his mentor. As a coach to youth, Zeus wanted to keep teaching people "that want to be great." Zeus admitted he had "done so much bad and been such a bad example for people, especially with having so much influence." Like Myra, Zeus did not come to Clearwater Academy for "some

redemption." He had only wanted coding literacy to obtain social mobility quickly. But the cultures of code he did encounter at Clearwater Academy showed him that he had many options in life and living "without a care, down the wrong direction" was no life for him.

Conclusion

In Clearwater Academy Black adult learners unconsciously hustled and grinded for practices of care to continue accessing coding literacy. Participants made financial and social sacrifices to attend the computer code bootcamp, sacrifices that weakened resistance to the consequences of racial and economic inequality: losing their homes, losing their jobs, and even losing their health. Care in this context required awareness of these dangers, of the everyday oppression Black adult learners encountered to and from, and sometimes during, class. Social services could help meet some of those challenges, but Black adult learners' stories suggest they needed more than this material and financial help from Clearwater Academy to keep their learning computer programming active; they needed to feel valued. Without that, Clearwater Academy would be just "just like anywhere else," to use the words of Pierre, where you must be on time for work and complete work regardless of what you have going on in your life that may disrupt that work altogether. Knowledge or even awareness that "we all have experienced trauma in some type of way and in some area, we are stunted," as Zeus put it so eloquently in a blog post for Clearwater Academy, helps build a strong web of relationships that allows carework to flow in meaningful ways. Not for personal gain but for genuine interest in the well-being of others. Simply being human motivates these practices of care.

Discourse about race and oppression in the context of coding literacy help envision a Black tech ecosystem that draws on an important feature of education for Black-identified people: building relational caring and communal networks. This feature takes cultures of code beyond mere diversity, equity, inclusion, and even belonging because it's rooted in common concerns for how one deals with oppression. Histories of racist policies in education, housing, and the economy create inequality, and without that knowledge, cultures of code continue practices that do harm against Black people, and other marginalized communities that dare to accept the so-called open invitation into tech. The events described in Clearwater Academy provide a roadmap for a curriculum centered on lived experiences with oppression and creates a window into how tech industries fully dismantle racism through its cultures and the designs it creates. Coding and employability skills and adapting to whiteness in tech workplaces do not provide significant pivots for Black adult

learners, and a diversity and inclusion effort must dig deeper into the injustice that perpetuate division.

Chapter 3: Coding Black Functions for White Software Programs

> Google posts its job announcements on its website, so in theory, anyone with access to the Internet has the opportunity to apply. In practice, though, the jobs are closed to all but a small minority of people who have the education, experience, and personal contacts to pass extensive rounds of interviews and aptitude tests. I know many low-income people who would like nothing more than a well-paying job at a global technology company. But it doesn't matter whether they can browse engineering jobs on their phones. Online opportunity isn't always actual opportunity.
>
> – Kentaro Toyama, *Geek Heresy: Rescuing Social Change from the Cult of Technology*

Seventeen-year-old Trayvon Martin traveled with his father to Sanford, Florida to visit his future stepmother. That night, Martin walked to the convenience store to buy Skittles and watermelon juice. Neighborhood watch guard George Zimmerman spotted Martin walking back to the townhouse from the store and called 911. He claimed this hoodie-wearing man was on drugs. Zimmerman disregarded the dispatchers' warnings to not pursue Martin; he chased after the teenager and, after a struggled, gunned him down. As evidence, the hoodie did little to put Zimmerman in prison: he was acquitted in 2013, and in 2015 the Department of Justice decided to not charge him for violating Martin's civil rights. The federal government returned the hoodie to Trayvon's father in Florida with the Skittles and the juice. Finally, on August 21, 2021, the National Museum of African American History and Culture placed Trayvon's possessions on display (Roig-Franzia, 2022). The hoodie had more success as a symbol of civil rights activism against extrajudicial execution of unarmed Black men and boys. Trayvon Martin's death animated Van Jones, President Barack Obama's advisor, and the legendary musician Prince to found what was then called #YesWeCode, an initiative to train 100,000 Black youth in computer programming. Martin's hoodie became the central image of their efforts. Van Jones launched the project at the 20th Anniversary Essence Festival in 2014, where he shared the following story of #YesWeCode's birth:

> After the Trayvon Martin verdict I was talking to Prince and he said, "You know, every time people see a young black man wearing a hoodie, they think, he's a thug. But if they see a young white guy wearing a hoodie they think, oh that might be Mark Zuckerberg. That might be a dot-com billionaire." I said, "Well, yeah, Prince that's true but that's because of racism." And he said, 'No, it's because we have not produced enough black Mark Zuckerbergs. That's on us. That's on us. To deal with what we're not doing to get our young people prepared to be a part of this new information economy." (Rebuild The Dream, 2016)

Jones and Prince did make a good point: the opportunity to learn computer programming is an opportunity of profound transformation. Gas station attendants and retail associates can transform into one of the most highly valued positions in our digital economy. That isn't a metaphor but a real possibility, as most Black people in the private sector are frontline workers in three industries that offer less pay and fewer opportunities for upward social mobility: healthcare, retail, and accommodation and food service (Mckinsey & Company, 2021). Although computer programming is an emerging, specialized type of writing, public discourse suggests it's not really complicated if the factory worker or coal miner with basic computer knowledge can pick it up. The ease of access to and learning of coding literacy reinforces the idea that coding can be a driver for social mobility, which is endemic in conversations about democratizing computer science education. This *dream* of transformation is the heart of pipeline rhetoric.

However, when the appeal of "transforming" low-income workers into software developers applies to racially marginalized people, the imagined narrative above brings to bear legacies of racism and education. Historically, education for Black youth and adults in the United States has included implicit and explicit efforts to assimilate them into white middle-class society, to erase Black language practices and cultures, and to teach anti-Black linguistic racism (Baker-Bell, 2020; Gere et al., 2021). Public schools and universities continue this legacy of undue violence against Black people (Green et al., 2018; Hardaway et al., 2019; Joseph-Salisbury, 2019; Solorzano et al., 2000; Yosso et al., 2009). The student loan debt accumulated for attending universities adds to, not relieves, the financial strains of historically excluded people (Seamster & Charron-Chénier, 2017). And even after getting through college, the workplace welcomes Black people into more racial violence (Bohonos, 2021). Black people in the United States can live their entire lives moving from one anti-Black space to another with no chance of ever achieving the liberation

and well-being so long desired. Educational institutions cannot hide behind claims of distributing literacy for social mobility while supporting anti-Black policies, practices, and outcomes.

Chapter 3 arrests attention on computer code bootcamps as educational institutions that must also grapple with the reality that race and racism determine how Black adult learners and their instructors do and do not leverage coding literacy into social mobility. In this chapter, I argue that computer code bootcamps are racial organizations whose curricula and assessment practices "program" racially marginalized people into viable bits of code called *functions* to assist in designing white software systems—the technologies that largely center white end users and uphold white supremacist policies and practices. I analyze focus group interviews with Clearwater Academy instructors Richard and Jessica and Black adult learners and my own participant observation to understand how the computer code bootcamps' curriculum and assessment practices rhetorically shape their lived experiences. Clearwater Academy's curriculum and assessment suggests that Richard and Jessica must balance the needs of tech employers with the mission of ending racism and poverty. However, living according to these designs led Black adult learners to question the intentions and approaches of career training programs; they proposed an alternative curriculum design based on their own knowledge and lived experiences to create a Black coding literacy.

An empirical look at how racially marginalized people experience curriculum and assessment helps identify the limitations of those designs and the consequences those limitations can have on adult learners and even the instructors. The coding movement must contend with these investigations to achieve its proposed outcome of including marginalized populations in a profession that has predominantly been the space built for white men. In a study on the perspectives of Black Indigenous People of Color (BIPOC) computer science teachers, researchers Ivey et. al. (2021) argue that despite multiple conclusions that computer science education needs to teach critical digital literacies, the movement defines inclusion as access. Stopping at giving access to the tools of computer programming still "predominantly centers a Eurocentric perspective with little attention paid to the teachers (or students) who exist outside of the mythical computing identity norm of white, middle class, and male and 'color-blind rhetoric'" (n.p.). Not paying attention to these marginalized instructors and adult learners makes computer science, and training schools like computer code bootcamps, inadequate educational institutions for their needs.

In this chapter, I introduce racial organizations as a theoretical concept to better understand the pipeline rhetoric of coding movements as an interlocking *system of intra-organizations* that use coding literacy to help strengthen racial order in the United States. I use "coding function" as a metaphor

for writing (Alexander et al., 2020) to help literacy scholars study computer programming as a racialized literacy that *acts* on our bodies and minds when we engage with it through curricula design and assessment practices. Computerscience education continues to expand in public schools while enrollment among diverse students increases in university computer science programs (National Academies of Sciences, Engineering, and Medicine, 2018; CSforALL, 2021). Because the coding movement has expanded in the years since my study concluded in 2018, racial organizations and coding functions remain relevant concepts. Both may help computer code bootcamps and other computer science and literacy educators probe their intentions for coding literacy curricula, their approach to teaching coding, and what about coding we are teaching to racially marginalized learners, youth or adults. Unlocking interested parties' influence on computer code bootcamps especially helps them interrogate the ways we have brought the legacy of racializing written and oral language practices into computer programming.

Racial Organizations and Literacy as White Property and Economic Resource

Literacy scholars understand that reading and writing are a set of actions or behaviors; they are also a material resource tied to understood sociocultural meanings. In other words, we interact with literacy through objects like immigration papers (Vieira, 2016), education diplomas, and laptops (Vieira, 2019) and we give them significant meaning to navigate various social contexts (Brandt & Clinton, 2002; Burnett et al., 2014). The materials of literacy also have money-making power: In *Literacy in American Lives* literacy researcher Deborah Brandt (2001) observes that

> The nature of work in the United States puts a premium on the ability to traffic in symbols generally and in verbal symbols particularly, as print and print-based technologies have penetrated into virtually all aspects of money making. In an information economy, reading and writing serve as input, output, and conduit for producing profit and winning economic advantage (p. 25)

Brandt's observation that performing literacy practices with symbol systems that turn knowledge into profit contextualizes literacy sponsors (people but also institutions like computer code bootcamps) as managing the resources of literacy. They determine who accesses those resources and what rewards literate people accrue from leveraging those resources. Social, cultural, and economic demands can shift the materials of literacy and its value, and "As

literacy standards change, some people are economically lifted (think computer coders), and others are left behind (think typists). Keeping up with changing literacy standards requires investment—investment that depending on age, gender, race, social class, and other positions—is not equally accessible" (Vieira et al., 2020, p. 47). Opportunities to learn literacy, "in school and out," writes Brandt, "takes place within systems of unequal subsidy and unequal reward—systems that range beyond the influence of any individual family's assets, beyond any one pile of cultural capital that a adult learner or a home might accumulate" (2001, p. 170).

Studies on literacy can show how institutional racism provides a framework for governing the output and reward of literacy as an economic and material resource, often establishing white people as the most deserving of literacy's power and privilege. For example, literacy researcher Catherine Prendergast (2002) analyzes three significant Supreme Court cases on educational policy to demonstrate that literacy belongs to white racial identities in the United States: *Brown v. Board of Education* (1954), *Washington v. Davis* (1976), and *Regents of the University of California v. Bakke* (1978). While *Brown* eliminated racial segregation based in part on the psychological harm it causes Black children, the Supreme Court argued that Black children would fare better by attending integrated schools. This decision upheld the perspective that whites were superior to Black people and, more important, the superiority of the literacies they learn and use in public schools. In *Washington v. Davis*, the Supreme Court backtracked on the value of literacy. The justices questioned whether a high school diploma alone was sufficient for professional employability since the standards of education, they believed, had declined in recent years. The justices ruled that an exam that disproportionately disqualified Black applicants from police officer positions was fair because the exam was a necessary response to so-called poor education. Finally, during the *Regents of the University of California v. Bakke* both the defense for UC Davis Medical School and some of the Supreme Court justices realized they were alumni of Harvard University. Both shared an interest in protecting and upholding the institution's standards of literacy; they also pushed Harvard's own admissions program forward as a fair example and "determiner of constitutionality" (Prendergast, 2002, p. 225). Like *Washington*, *Bakke* questioned the need for affirmative action if more Black people entered these top schools and did well in their academic studies; hence, consideration of race in a university known for racial discrimination seemed unnecessary. Prendergast concludes that "Once remedy is granted in one literacy environment, that literacy environment is denigrated to devalue its worth. This is the economy of literacy as white property, an economy that served the white majority in the Supreme Court in its efforts to bring the course of racial justice to a halt" (Prendergast, 2002, p. 227).

Literacy scholars are well-positioned to study institutional racism, or how systemic policies and laws provide different kinds of access to literacy based on various social markers, especially race and ethnicity. However, sometimes literacy scholars—myself included—focus on how a single organization represents the macro-level of institutional racism. There's an opportunity to complicate our research by studying how systems of intra-organizations use literacy to construct race in the United States. With this approach, we widen our critical inquiry to how literacy sponsors are *collectively linked* in determining the life outcomes of their students, trainees, and workers and how these subjects collectively change those same institutions (or not). The coding movement's pipeline rhetoric provides an opportunity to learn the relationship between computer code bootcamps and the tech industry under the lens of critical race and digital studies. This approach helps me learn how computer code bootcamps participate in constructions of race in the United States.

Racial organizational theory provides an analytical rubric for doing this analysis. Sociologist Victor Ray (2019) argues that scholars of race and ethnicity have opportunities to uncover how racial ideologies operate through material resources. He observes that when race and ethnicity scholars study organizations, they can mistake institutional racism and organizational racism as one and the same (i.e. laws, policies, and practices partnering with school systems). These two belong to a three-tiered system of bigotry, in which school systems and workplaces are positioned between individual biases and the laws, policies, and practices that structure societal racial order. What goes under-examined is how organizations in this middle, or meso-level, tier contribute to the mundane reproduction of racial stratification. According to Ray (2019), "Individual racial attitudes and discrimination are enabled or constrained by organizational routines. More than a mere 'link' between macro- and micro-level processes, organizations are key to stability and change for the entire racial order. Organizations magnify the power and depth of racial projects and are a primary terrain of racial contestation" (p. 30). In other words, rather than contextualizing higher education, public schools, and career training academies as working within institutional racism, race and ethnic studies scholars should study these organizations as standalone sites that influence individual racist behavior and societal racial order.

Racial organizations amplify schemas about how material and social resources should be distributed among racial groups, and they amplify ideologies that justify this racial structure. Organizations consolidate power and resources and build them into social interactions that replicate these established racial structures and beliefs and influence the racial (institutional) order of society. In addition, racial organizations can shape "motivation, agency, and action in relation to resources and schema" (Ray, 2019, p. 35) in three

ways: First, they can unequally distribute resources, valuing white organizations over people of color organizations (such as the significant gap in grant funding between Historically Black Colleges and Universities [HBCUs] and Predominantly White Institutions [PWIs}); second, they require whiteness as a credential to access organizational resources. For example, a 2014 study on the relationship among race, gender, and criminal background in hiring for entry-level jobs found that hiring managers were more likely to interview white people with a criminal record than Black people without a criminal record (Decker et al., 2014); and third, racial organizations separate commitments to diversity, equity, and inclusion (DEI) from the practices and policies that lead to DEI. Thus, "objective rules and practices may be enforced in ways that disadvantage non-Whites[sic], or rules aimed at diversifying or ending discrimination may be ignored. This decoupling allows organizations to maintain legitimacy and appear neutral or even progressive while doing little to intervene in pervasive patterns of racial inequality" (Ray, 2019, p. 42).

Racial organization theory shows how the racial state influences the practices and policies of meso-level organizations and vice versa; the two aren't the same but rather are partners in determining how racially marginalized people navigate their lived experiences within and outside of work. More than racial ideology, social and material resources owned by such organizations shape people's working and private lives, with an interest in preserving and legitimizing whiteness. To this end, racial organizations can also re-direct racially marginalized people's agency for a specific purpose, one that sends them to the bottom of organizational hierarchy. However, subjects of racial organizations are not helpless or passive. Just as racial organizations can support existing societal racial order, they can also change the racial order for the better, sometimes thanks to on-the-groundwork of racial groups. Social movements, changes in policy, and reliance on the state "result from altering schema-resource couplings" (Ray, 2019, p. 43). Revising racial associations with resources within organizations may revolutionize the societal racial order. This not only happens in organizations; organizations can interfere with the policies and practices of one another, as well. This last point is a key focus for my analysis of the relationship between computer code bootcamps and tech companies later in this chapter.

The introduction of racial organizational theory as a framework brings into sharper relief how emerging literacies can be co-opted for whiteness. As a site for allocating social and material resources, racial organizations draw in not only literacy but literacy as a resource that economically benefits whites the most; they adopt the practices and beliefs about race to dictate literacy distribution within their organization. In doing so, they can constrain and stratify racial groups' agency with literacy from within to support the racial order without. I contend that constraints and stratifications work across

interrelated organizations in the so-called pipeline of computer code bootcamp to software development. Explicitly linking racial organizations with coding literacy tells a complicated story of how the coding movement, the ready-to-work model, participates in and perpetuates racism inside of tech. This helps further challenge aspirations of and claims to a post-racial tech industry as the end-goal of the pipeline rhetoric.

Racial organizational theory and coding literacy help transform emerging literacies' association with Blackness into positive practices. Naming Black coding literacies reveals new alternative ways Black people use coding literacy resources to achieve different outcomes. These changes in "material relations … through human agency" creates conditions that change the racial order overall (Ray, 2019, p. 47). Without giving too much credit to emergent literacies as autonomous forces (Street, 1984; Vieira, 2016), new types of writing may be the tools that activate social justice efforts. I focus on emerging literacies having this possibility because they challenge public schools, post-secondary institutions, and workplaces to create new practices that broaden people's access to these desired literacies, as is happening with more diverse students and adults learning computer programming. It is the moment before they are highly embedded in everyday life and professional practice that emerging literacies can evoke new conversations on societal racial order. What anti-racist possibilities exist for coding literacy education in computer code bootcamps? I show glimpses of an answer later in this chapter and in the Conclusion. In the next section, I explain how racial organizational theory applies to the relationship between computer code bootcamps and tech companies, focusing on hiring practices and education.

Big Tech and Computer Code Bootcamps as Racial Organizations

In Spring 2018, a few months after completing my participant observations at Clearwater Academy, I attended a diversity in tech panel hosted by the downtown public library. Local tech professionals, community activists, and computer science professors spoke about race, racism, and working in Sakowin's technology sector. Among the panelists was Richard, the technical skills instructor for Clearwater Academy. In his assessment of the local job market for Black and Brown coders, Richard noted that tech companies invested in white coders from outside of the state rather than local talent. Few coders of color already worked in Sakowin, and the tech sector, panelists indicated early in the discussion, was hardly welcoming to those historically excluded coders. The insistence on hiring nationwide further exacerbated disparities in hiring diverse coders. The city itself didn't offer a flourishing future for BIPOC

workers and their children, so even if the workplace restructured its culture, the community around it burden coders' families.

When local tech companies did hire, they pulled talent from a Sakowin University, a well-resourced and internationally recognized PWI. One hiring manager on the panel explained, "When you think about a four-year traditional college like [that school] as the only source for talent, you eliminate a lot of people who can't, one, afford the college and, two, who don't want to go to the college because they don't like the [racial] environment that it cultivates." Instead, tech companies should look to other learning environments many BIPOC attend, such as community colleges and Historically Black Colleges and Universities. In addition, panelists noted, there are a host of nonprofit organizations that work exclusively with Black youth interested in tech.

This panel discussion shows how the microcosm of tech in Sakowin carries the influences of macro-level organizations of Big Tech in Silicon Valley. These smaller local startups use Big Tech's racial schemas to determine how coding literacy, and its rewards in the economy, gets distributed across racial groups. It is well-known that Big Tech prides itself on color-evasive racism, post-racialism, and meritocracy as its guiding philosophy for hiring, investment, and technological design. In their far-reaching analysis, however, internet studies scholars Safiya Noble and Sarah Roberts (Noble & Roberts, 2019) find that Big Tech's acceptance of post-racial ideology re-enforces racism. In hiring and representation of its workforce, for example, venture capitalists invest money and resources to startups based on cultural fit, a way to categorize people "most like themselves, or most like the networks they engage" (Noble & Roberts, 2019, p. 119). Those networks may often be white, male, and heteronormative, thus eliding that any Black-owned startup will not receive funding. One may argue that Silicon Valley invests in people from the Global South to indicate their commitment to diversity, but this, Noble and Roberts note, are screens to avoid discussing their consistent discrimination against *domestic* Black, Latine, and Indigenous people. Even the representation of Global South people in the workforce hides racist tropes and stereotypes to suit the needs of their white counterparts, as seen in the television show *Silicon Valley* (Noble & Roberts, 2019).

Big Tech recruits new software developers from the best computer science programs in the United States, the top three of which include University of Washington; University of Berkley, California; and Stanford University (Staley, 2017). These programs have majority white and male recent graduates, many of whom already have internships at top tech companies. Their knowledge of computer programming coupled with learning the cultures of tech companies suggest they are primed for working within the hallowed halls of Big Tech. Meanwhile, organizations that serve Black people—HBCUs, nonprofits, extracurricular clubs, and computer code bootcamps—maybe perceived

as not producing as talented coders as majority-white educational programs. This racialization of coding literacy can then "[replicate] across many organizational forms", "formalized by gatekeepers and exert top-down pressure on subordinates, potentially shifting the relation between schema and resources" (Ray, 2019, p. 34). Richard and Jessica speculated that one reason Sakowin tech companies wanted to support Clearwater Academy was not only the value of computer code bootcamps but also because they were spooked when Google revealed that their workforce was majority white and male in 2014, advocates called them out on their failures to diversify. They were more than happy to collaborate with the only accredited computer code bootcamp that trained historically marginalized people to avoid tough criticism.

Computer code bootcamps can play a crucial role in replicating racial schemas of coding literacy. In doing so, they maintain coding literacy as white property. Recall from Prendergast's analysis above, that granting equal and equitable access to literacy depreciates its value to white people, which can inspire white flight and question the value of education itself. I would argue that because our digital ecosystems rely so much on white perspectives and lived experiences, white flight isn't a viable choice in response to equal and equitable access to computer programming for work; to do so would leave the tools and opportunities of software in new Blacker and Browner hands responsible for our digital ecosystem, one that may challenge whiteness. Computer code bootcamps must *prevent* white flight and the so-called loss of computer programming standards as more Black and Brown coders join the industry.

Computer code bootcamps as racial organizations facilitate insights on race and coding literacy as a practice. For the rest of this chapter, I explore the "material and social-relational foundations, not to mention [the] tangible consequences" (Burke 2016, p. 104) of computer code bootcamps as racial organizations. What's the *impact* on the instructors and their adult learners as they feel the call to uphold standards of computer programming and standards of professionalism in a white context while trying to promote racial justice and Black independence? In exploring this question, I consider how Clearwater Academy instructors and adult learners have begun rethinking the racial schema-resource coupling of coding literacy in computer code bootcamps.

Coding Black Functions for White Software Programs

In the section above, I've explained how Big Tech and computer code bootcamps are interlinked racial organizations based on hiring practices and educational training. Here I want to explain the technical metaphorical framing that rises from my analyzing the focus group interviews and observations I conducted at Clearwater Academy: coding functions. Functions are mini-programs

that contain a set of instructions to accomplish a one specific task. They are easily portable across different kinds of programs, and the coder doesn't need to know what specific lines of code run the function; often coders will "call" or command the computer to run invisible instructions within the function. The more I listened to adult learners and instructors discuss their training in coding literacy, the more I began to re-think Clearwater Academy's racial justice project as a coding sprint itself. Figures 3.1 and 3.2 below lists a series of functions for a banking application I wrote in Python. Each function begins with "def," followed by a descriptive name of the function and the variables that function will take in. In Figure 3.1 the first function is the checking account balance, and it takes in all transactions a client has completed. The function must then do something with that data. In this case, the program includes a mathematical formula—"sum(transactions)"—that will total the number of transactions and then reveal, or "return", the total. Functions like these combine to create the program seen in the second image, which includes user inputs and if-then statements to activate functions. What results is a fully working, though rudimentary, online banking system. The functions in this banking program never change; they, I would say, remain dormant until they are called to carry out specific tasks that make the entire program work.

Writing researchers Jonathan Alexander, Karen Lunsford, and Carl Whithaus (2020; Whithaus et al., 2022) note that scholars use many metaphors to describe their studies of writing (i.e. worlds apart, literacy in the wild, ecologies and networks, and transfer) to "see different aspects of the writing process, the rhetorical situations in which writing occurs, and the perceived agency of writers themselves" (Alexander et al., 2020, p. 106). In addition, the metaphor used "might determine and condition how scholars are approaching, understanding, and analyzing their objects of study" (Alexander et al., 2020, p. 107). The authors wonder how metaphors can do more than just determine approaches to studying but also suggest what hasn't been studied or what implications different metaphors have for writing. I find their longitudinal work on "wayfinding" -- a new metaphor they suggest studying to understand the writing lives of college alumni -- inspirational for focusing my own analysis on what's happening in Clearwater Academy and its operations as a racial organization that codes functions.

```
def balance(client_transactions,name):
    """Adds the total number of transactions the client has completed"""
    return sum(client_transactions)

def available_credit(client_transactions,name):
    """Returns the available credit that the user has left"""
    return customer_accounts[name] - balance(client_transactions,name)
```

Figure 3.1. Screenshot of two functions written in Python.

```
def main():
    """This function runs the electronic banking program."""
    print "Welcome to the Credit Card Accounts Online!"
    print ""
    while True:
                account_limit = random.randint(500,50000)
                print ""
                print "What would you like to do? \n 1. Create a new account \n 2. Make a
                choice = input("Your choice:")
                while choice < 1 or choice > 4: #If user input is less than 1 or more tha
                        print "Invalid choice!"
                        choice = input("Your choice:")
                if choice == 1: #if condition for choosing 1
                        name = raw_input("Account name: ")
                        while name in customer_accounts: #checks if the name is already i
                                print "Error: account", name ,"already exists."
                                name = raw_input("Account name: ")
                        customer_accounts[name] = account_limit
                        client_transactions[name] = []
                        print "New account created for", str(name) + ".", "Credit limit i
                if choice == 2: #if condition for choosing 2
                        while not customer_accounts: #checks if there are no accounts in
                                print "Error: no account exists."
                                print ""
                                main()
                        name = raw_input("Which account? ")
                        new_transaction = input("How much is your transaction? ")
                        while new_transaction < 0:
                                print "Invalid transaction! Must be a positive number."
                                client_transactions[name] = input("How much is your trans
                        if check_availability(new_transaction,client_transactions[name],c
                                make_transaction(new_transaction,client_transactions[name
                                print "Success! Your balance is", str(balance(client_tran
                                print ""
                        if check_availability(new_transaction,client_transactions[name],c
                                print "Transaction rejected. Your available credit is $"
                if choice == 3: #if condition for choosing 3
                        while not customer_accounts: #test if user inputs 3 as a choice w
                                print "Error: no account exists."
                                print ""
                                main()
                                print ""
                        name = raw_input("Which account? ")
                        if name in customer_accounts and client_transactions: #if the nam
                                print statement(client_transactions[name],customer_accoun
                        else:
                                print "Error: no account exists."
                                print ""
                main()
                if choice == 4:
                        print "Done!"
                        quit() #this function exits the program altogether

if __name__ == "__main__":
    main()
```

Figure 3.2. Screenshot of rudimentary banking account system made of multiple functions.

When used as a metaphor, functions in object-oriented programming have different implications for racial hierarchy in the project to democratize coding and diversify the tech industry. Through the method of writing code, mixed with the purpose of computer code bootcamps—job training—adult learners learn to support the profit imperative of Western corporations. To be clear: the economic potential of learning coding matters for Black people, given the tremendous wealth gap between themselves and white people (Shapiro, 2017). Clearwater Academy adult learners in this study had practical economic reasons for attending the computer code bootcamp, such as becoming

entrepreneurs to support their families and local communities. But the way code works for Black people specifically—a cultural basis for computer programming—isn't the main concern for some computer code bootcamps. Eliding a Black coding literacy suggests that computer code bootcamps train Black people as small programs that can be reused in one company after another without disrupting the industry's mandate to preserve white technological design. They are coding Black functions.

As instructors Richard and Jessica and the Black adult learners discuss below, the purpose of Black professionalization into software isn't to create dynamic, creative coders but rather docile and passive members that bring color to tech while keeping its sociocultural practices. While "cultural fit" matters for promoting community-building and inclusion, it can come at the expense of promoting the health and well-being of its marginalized literate workers. Cloaked with credentialed whiteness, these Black coders are functions meant to "disappear" or "fuse" into the racial organization, continuing the race systems that perpetuate inequality.

In the following section, I describe Clearwater Academy's teaching and assessment practices and the challenges of teaching coding literacy and employability skills. First, I explain the exigencies that shape Clearwater Academy's curriculum design. Then I explain in-depth how Richard and Jessica teach this curriculum. Their reflections and intentions reveal critical awareness that helping low-income racially marginalized adults succeed in a majority-white tech sector requires that they shape them into literate subjects that may exclude their full humanity as Black people. I weave into this section perspectives of the adult learners to show the conflict between Richard and Jessica's honest hope for their adult learners and the expectations of their Black adult learners. My analysis postulates that Clearwater Academy has been positioned to materially and metaphorically code Black functions for white software programs, but my analysis also attempts to reconcile the two perspectives on the material consequences of working in computer code bootcamps as racial organizations.

We Are Not a School: Exigency for Clearwater Academy's Curriculum

When I first visited Clearwater Academy in Spring 2017, I expected significant emphasis on learning HTML, CSS, and JavaScript. Richard and Jessica split the curriculum at that time between 50 percent coding instruction and 50 percent "employability skills" instruction, which included learning the written genres and behaviors associated with the workplace and professionalism: mock interviews, résumé and cover letter writing, timeliness, self-care, and financial well-being. By fall 2017, when I returned for my second round of participant

observations and interviews, Richard and Jessica increased employability skills to two-thirds of the curriculum. Why de-emphasize computer programming itself? As I describe in Chapter 1, the professional and cultural backgrounds their adult learners would bring with them weren't suitable for tech. "They have to get in a room and work the room, and they've never been in a scenario like that," Richard explained to me during an interview in November. "In all honesty, the bottom line is without the employability skills there is no job for these folks. There's no way they get into these positions—in briefcase, suit-wearing business-type positions—after having gas station and retail being the best opportunity they ever had. If we don't teach those skills, they cannot survive, and they will blow it for everyone following. It is that simple."

Richard's observation evokes a persistent problem during Clearwater Academy's early days. In the first two years of the training program, Richard's predecessors, two Black women coders, spent most of the 14 weeks teaching adult learners web design and computer programming. However, graduates interning with tech sponsors and other interested employers had trouble adapting to the companies' "appropriate ways of acting, interacting, participating, and participant structures" (Gee, 2011, p. 90). The following quote from Chapter 1 relates to my analysis in this chapter: when Richard spoke with tech sponsors about their experiences with Clearwater Academy, they told him that "there's no way these people should be in our office working. These people didn't know how to work, be employees. They had very bad habits. Social skills."

To get an idea what these "bad habits" looked like, Jessica showed me an etiquette quiz that she used to prepare adult learners for work. Each question was based on actual incidents in previous internships. By the time I began my study, Jessica had stopped using this quiz, but it nevertheless demonstrates the social and cultural tensions between Clearwater Academy graduates and its tech sponsors. In the directions, adult learners are asked to give their "honest answer [on] how you would act in the work environment." For example:

> 2. While you're waiting for your computer to be fixed …
>
> a. It'll take a while. Kick back, relax and take a quick nap.
>
> b. Pull out the employee handbook, prop your feet on the desk, and read it.
>
> c. Find your supervisor and ask them what you should do in the meantime.
>
> d. Ask your coworker if they need help.

Other incidents the quiz covered included negotiating salary, how often to take a smoke break (the first choice is "8 – one every hour") and having

a consistent work schedule. Interns made fried chicken in breakrooms and tried to sell marijuana to their supervisors while on the job. The "social skills" problem occurred even before the internship. Richard and Jessica scheduled tours of tech companies for their adult learners throughout the semester, so they could get first-hand experience of what it's like working in a tech office. During a visit to one major tech company in Sakowin, Richard saw adult learners "[clean] out about fifteen bowls of candy distributed throughout fifteen rooms." While the company did allow them to take some candy, that did not mean they could "take handfuls and put [them] in their pocket," Jessica explained. Richard framed the incident as a "Rodney King Loot Night," referring to the 1992 Los Angeles race riots that occurred after a jury acquitted four white police officers of excessively beating Rodney King. Between April 29 and May 4 rioters looted many stores owned by Asian/Asian Americans and Black people. Learning from this and other incidents, Jessica would tell future adult learners that they "take nothing" from these companies. A few semesters later, one class followed this direction: although a company representative said they could take popcorn and water bottles from the boardroom, no one took anything until Jessica gave them permission. "It was so, so good," Jessica said, "because they had taken us seriously about these things. And I think it just shows a different standard, even compared to [the fall 2016 class]. It's good to be taken seriously but it's also because they're learning."

While adult learners learn professionalism on one side of the curriculum, instruction in web design (HTML, CSS, JavaScript, and Wordpress) follows Google's learning about learning framework on the other side. Using FreeCodeCamp to learn HTML, CSS, and JavaScript taught adult learners the basics in web design. The website also inadvertently demonstrated the importance of following directions in the workplace. When adult learners understood the rudiments of web design, Richard became interested in their "[being] able to prove to me that you can read, follow instructions, make it through the steps, because that's what any job is about. You're gonna be given instruction, given a task, and it's gonna be up to you to go from here to here. My biggest focus is teaching them that, not everything about JavaScript." Learning coding itself wasn't an issue, because the nature of computer programming awarded access to more types of languages. As Richard explained during our interview in the fall, "Once you have the understanding of how programming works and their logical processes, then you can learn any other programming language in seven days." Adult learners would have to juggle multiple languages to get the jobs they wanted until one day they would only need to become, in Richard's words, a "guru" in one language later in their career.

I have experienced what Richard describes. The semester before I began my ethnographic research at Clearwater Academy, I took a college course in Python,

a computer programming language considered the "gateway" to computer science. A year later I tried helping Zeus with an exercise about variables and if-then statements in JavaScript. Although I did not know JavaScript, I could easily identify which lines of code had variables. I pointed these out to Zeus and explained their purposes. With my help, he finished the exercise and moved on to the next. Richard made sure that adult learners work on code independently in FreeCodeCamp but take those skills into team projects. They prepare and practice mock interviews and elevator pitches with mentors from the tech industry, and they work through coding problems with tutors each week.

Richard and Jessica made an important distinction during both interviews on Clearwater Academy's adult learners, curriculum, instruction, and assessment. "The bottom-line is this is employment training, not a school," Richard explained. Jessica co-signed this point in a separate interview, emphasizing that "we want to create employable people, and that is what we care for." While higher education is often mandated to make adult learners career-ready, they still do so under a model that distributes knowledge about computer science for a degree that prepare adult learners for a variety of other career pathways; Clearwater Academy is in the business of coding literacy education *for work*, whether adult learners become freelance coders or employed coders of a company. Clearwater Academy has a specific environment in mind, and their teaching coding literacy in the sociocultural contexts of offices and clients will get Black adult learners there.

The move from teaching only web design to teaching coding literacy in its context aligns with theories in New Literacy Studies. For example, the initial strict focus on coding in the early days of Clearwater Academy suggests that coding alone will make adult learners successful in the same ways anthropologists once postulated that ancient literate societies modernized because they developed writing, which shaped the mind to closely analyze and question the world around them (Olson, 1977; Ong, 1986) Literacy scholar Brian Street(1984) argues that this perspective (an autonomous model of literacy) gives too much power to literacy and ignores the ways literacy actually helps *create* and *support* existing inequalities and ideologies that accumulate institutional power for some and stratification for everyone. Understanding literacy as a social practice (Barton & Hamilton, 1998) in its variety reveals power, oppression, and liberation in the complex ways these three forces interact for human beings. Language use, ways of being, and ways of doing coalesce into communities and social institutions that people must fit into. Coding literacy facilitates these interactions as much as communities of practices defines the coding literacy practices that matter (Wenger, 1998).

Too much emphasis leaves adult learners floundering and failing in the sea of values, traditions, and expectations of being in the tech workplace; like the

autonomous model of literacy, the context in which coding works goes unnoticed. In practice, computer programming and employability skills *can't* be taught separately. Richard and Jessica recognize the conflict and teach Black adult learners to consider that communicating technical knowledge with clients and employers—in writing and speaking—are key components of their coding literacy (i.e. learning how to talk to clients does require knowing how web design works but Clearwater Academy adult learners must learn how to be personable with those clients). Under an implicit racist system, Richard and Jessica cannot draw connections between coding and the sociocultural and material contexts of software development that help Black adult learners imagine other possibilities. The curriculum design defines diversity and inclusion according to the tech sponsors' definition (see Chapter 2 for more) and not in ways that change the companies' cultures and practices.

In the following pages, I first describe the assessment philosophy Richard and Jessica deployed in Clearwater Academy. Then I dive into specific examples that demonstrate how their assessment practices can be racially coded in ways they didn't intend but nevertheless they find necessary. Finally, I show how they and Black adult learners observe that these racially coded assessment practices suggest the real intentions of the tech sponsors interested in Clearwater Academy. The materials and social consequences, they find, do not advance them forward materially or socially but rather create what I call Black functions for white software programs. However, these conflicts between figured worlds (Gee, 2011) open pathways of escape from being a coded Black function.

Racially Coded Assessment Practices

Earlier in this chapter I explained how Clearwater Academy wasn't a school; it was a training academy for employability in software development. To underscore this point, the class syllabus announced to adult learners that the coding bootcamp was a "worksite." Adult learners were "employees" subjected to all the expectations that come with that title: attendance, turning in work on time, and following instructions. Richard and Jessica hoped that their adult learners would take the training program seriously. The point was to show adult learners "what it's like on the job." Turning in assignments late, arriving at Clearwater Academy late, not attending "class," and missing mandatory meetings like mock interviews and company tours were the top reasons adult learners failed Clearwater Academy, not their computer programming skills. In fact, behaving like employees can matter more than the content they produce. Jessica explained that a good résumé and cover letter matters but adult learners received points based on simply turning in assignments on time.

Even the best coders must be held accountable for failing these employability skills. "It's a complete disservice if we let them through," explained Richard. "When people aren't held accountable and given the opportunity, they don't know what that opportunity offers, what the value is, what it really means to have it, because you haven't gone through the process." The stakes could be high for everyone at Clearwater Academy: failing an internship opportunity because of their behavior may permanently ruin that partnership for Clearwater Academy. Richard and Jessica were wary to recommend a graduate for hire who hadn't demonstrated honesty, integrity, and accountability.

That said, Richard and Jessica did not let the "objectivity" of points and attendance drive assessment; they carefully attended to the subjectivity of their relationships with adult learners. The instructors recognized that they were working with people and that they truly desired that everyone succeed. Assessment was highly individualized based on their adult learners' needs. The instructors spent the first three weeks getting to know their adult learners to determine how best to communicate and assist in their success. Richard and Jessica balanced blunt feedback on adult learners' performance with real interest in supporting their learning and well-being. The tone and type of feedback shifted from person to person rather than everyone getting the same feedback. The instructors thought this individualized approach to assessment equitable. Because Clearwater Academy considers itself using a holistic approach to teaching and assessment, Richard and Jessica were aware of the racial and gender dynamics of their relationship with adult learners. Richard was a Black man and Jessica was a younger white woman. When they needed to pull adult learners aside for tough talks, Richard and Jessica both discussed who should lead the conversation based on the race and gender of the adult learner and the topic, especially if the topic had implications for one or more of the adult learners' social identities.

For example, in Richard and Jessica's judgement, Zeus, whom we met in the Introduction and in Chapter 2, needed tough love. In the beginning of the semester, Jessica said he "drove us crazy." At one point, any wrong move would've expelled him from Clearwater Academy. Halfway through the semester Zeus had been falling asleep in the middle of lectures and had a bad attitude with instructors and classmates. Richard and Jessica spoke with Zeus privately to figure out what was going on. He walked into the office "stone cold, like did not want to talk to us," explained Jessica. Both instructors "said some things that were harsh" but followed that up with "lots of love" that encouraged Zeus in his success. Zeus was almost in tears after the conversation. "His willingness to change," explained Richard, "is what keeps him in the class." Richard and Jessica speak truth to adult learners so they can prosper, which is why every conversation—no matter how blunt—ends with "What

do you need for support from us now? What do you need from us?" Richard and Jessica's assessment practices—as they emphasize again and again in our interviews—tied directly to the workplace itself. Tough conversations with adult learners about their behavior in class prepared them for what will happen; they will not, as Richard explained, "sugar coat it or make me think I'm walking into a fantasyland when you're basically walking into hell."

So far in reviewing assessment practices, Richard and Jessica prepare adult learners for the sociocultural contexts in which coding happens. There are a variety of implications for how timelines and collaboration matter in a company responsible for offering digital services from hundreds to millions of people. From the technical skills side, a small section of code can break the Internet (Collins, 2016; MacDonald, 2018; Williams, 2016); but failing to deliver a software package on time equally disrupts companies and their users' digital lives; a freelance developer late on website design doesn't get paid by their client on time, if they get paid at all. Showing up and not making excuses, for Richard and Jessica, makes computer programming and software work for users.

But Clearwater Academy wasn't just teaching a series of behaviors and habits that help adult learners leverage coding literacy into financial security; the assessment and teaching Richard and Jessica used also *shaped their adult learners' identities*. One of the interesting lessons Richard gave during my participant observations was the rhetorical work Black adult learners must do to get a job. Using himself as an example, Richard lectured to adult learners about how he didn't know every computer programming language, framework, or library, nor did he need to know them to get a job or get a new client. All Richard needed to do was walk into the room and make the employer or client *believe* he can do the work; if Clearwater Academy adult learners can make people believe they can do anything, they could be successful. During our interviews on assessment, Richard explained that he was hired to do one thing: "How to be whoever you need to be to get the job done."

Richard and Jessica understood they were in a difficult position on shaping adult learners' identities for computer programming. As Clearwater Academy became more well-known, an increasingly diverse group of adult learners applied to the training, partly thanks to graduating adult learners recommending the computer code bootcamp to their friends and family. Encountering new cultures and linguistic practices, Richard and Jessica begrudgingly accepted they participated in the racial order's demand that marginalized people assimilate, that they had to promote in veiled and not so veiled ways anti-Black linguistic racism (Baker-Bell, 2020). "Culturally and language-wise," Richard explained, these adult learners needed further teaching. One adult learner was a brilliant architect with big picture ideas, but Jessica could never

understand what he was talking about; another adult learner's job materials attracted plenty of requests for interviews but not one of those interviews landed the adult learner a job. The problem wasn't her English; employers considered her accent too thick. Richard and Jessica had one of the best adult learners in their class during my visits: a Black woman from Chicago who was "Super bright, good at asking questions, on top of things. Whenever she needs help, she goes to Richard's desk and waits patiently," explained Jessica. But her linguistic practices, learned from growing up in Chicago, hid her potential to employers; Jessica volunteered to help work on her speech. She admitted that there is nothing culturally or linguistically wrong with this Black woman adult learner, nor any other adult learner in Clearwater Academy. "It's just some of those barriers that employers, whether for better or worse, don't like, and will hold that against her. It's really not fair. it's hard for me as a white person because I ask people, 'Come to my side.' And it feels like that sometimes. It's not fair and I hate it. But at the same time we have to make decisions. Do you want a job, or do you not want a job?"

Individualized assessment and humanized relationship-building creates a culture of care in Clearwater Academy, yet they serve to fulfill a capitalist and racial outcome: create an employable person in tech, to teach them to be what they need to be to match the needs of their client or employer. Even if that means learning characteristics associated with whiteness. Humanizing assessment achieves that pragmatic philosophy of employability based on the conditions of whoever is convinced to hire Black coders. Under this pragmatic philosophy, computer code bootcamps can train non-resistant, docile coders (taking on any function name that defines their role in the program) that receive tasks (take in data), perform the tasks (execute instructions about that data), and produce a satisfying result (return some value). In my participant observations and focus interviews with instructors, there's no room for critiquing or questioning how the software or websites they design for others prompt social good or how to protect themselves from cultures of whiteness. Despite a program focused on training the United States' most vulnerable people, Clearwater Academy cannot position themselves to train an ethical or justice-informed technical communicator who can draw on their lived experiences and training to affect decision-making, from the smallest client to the largest company. A support assessment model would emphasize the Blackness missing from technological design and culture. Instead, careful emphasis on honesty, integrity, and good work helps Clearwater Academy re-write some lines of code and delete other lines of code in Black adult learners to make them functional pieces of white software design, exorcizing Blackness. Professionalism, capitalism, and pragmatism, nestled within humanizing assessment, teaches Black adult learners the cultural commands of whiteness

in software, how to plug in and stay in. This model works best for Clearwater Academy because it's the only model that seems to be acceptable to the companies responsible for Black social mobility.

The re-programming project on the bodies of Black people requires that material and social resources focus on adult learners most capable of becoming Black functions. The benchmark for success is professional whiteness, and the best opportunities continue to draw toward those adult learners. We've seen this play out with Zeus whose life circumstances and own perspectives on Clearwater Academy nearly forced Richard and Jessica to dismiss him from the class; in a hierarchy of who gets the resources for success, Zeus, for a time, was at the bottom. Interviews with the instructors revealed other instances of carefully directing resources where necessary. A recommendation from either or both Richard and Jessica lend powerful social capital to a Clearwater Academy graduate: internships and employment opportunities abound. Not all adult learners get these recommendations, however, despite their completing the training. They can return to Clearwater Academy for help the next semester and for the rest of their lives, even—after all, the program is still connected to a larger non-profit invested in social justice—but some opportunity has been missed because of their work during the program. Clearwater Academy, as an example of racial organization, commits to carefully distributing resources to adult learners with better circumstances and learning strategies than others, creating a gatekeeping mechanism that releases the most workable functions to the world and helping others find their own way to social mobility. Resources move based on who masters (pun intended) white racial schemas and those who do not delete their lines of Blackness.

"The New Shiny POC"

I conducted focus group interviews with participants from the 2017 spring and fall classes at Clearwater Academy in small, private rooms. I completed three interviews with the spring semester's adult learners at the beginning, middle, and end of the semester to capture their shifting perspectives, if any, as they worked throughout the program. Scheduling conflicts resulted in one end-of-the-semester focus group interview with participants from the fall class. Despite having only one focus group interview with the fall 2017 class, similar themes appeared in both classes. Much of what I describe and analyze below come from those final interviews and my participant observations.

Like Richard and Jessica, Black adult learners noted the difficult relationship among themselves, Clearwater Academy, and majority-white tech companies, sponsors, and other interested employers. Black adult learners identified the consequences of overemphasizing teaching the sociocultural contexts

of the tech workplace without challenging those cultures or showing adult learners how to use their lived experiences to change or create racially just coding cultures; they had joined a social reproduction (Collins, 2009) project that supported the practices of racial organizations rather than a social good project that benefitted them, if they could get a job in the first place. Black adult learners in this study grappled with the costs and benefits of this approach to acquiring coding literacy.

For example, Clearwater Academy's growing reputation attracted more support from the local sector over the years. During the spring 2017 focus group interview, Alice thought tech companies delivering money and other resources to computer code bootcamps like Clearwater Academy was a sign of goodwill toward anti-racism: "If they didn't support the mission, they wouldn't even partner with [Clearwater], they wouldn't take interns, they wouldn't take employees, they wouldn't donate money, they wouldn't do any of that." She wanted to stay optimistic that tech companies didn't just want to "look good." If that were the case, Alice reasoned, they could just hire one Black person and be done. With so many resources going into training low-income racially marginalized people and women, Alice believed, there must be something more than that—they must care about Black people developing coding literacy practices. However, other Black adult learners wondered if the tech companies' investment in Clearwater Academy really helped diversify the tech industry and promote anti-racist practices within coding. Alex, a classmate of Alice's, did not think that directing resources and money in their direction aligned with her optimism:

> I have seen people -- *I have seen people* -- who will do things publicly that are real good just for the sake of getting the kudos of having done something good … If you see, "Oh now I feel bad. Let's grab one or two and let's just make us feel better." Or "Let's grab a whole bunch and make sure everybody knows we feel better but really we still feel the same way that we feel."

Alex accused tech companies of being what law professor Nancy Leong calls identity capitalists—"ingroup members who profit from outgroup identit[ies]" (2021, p. 3). That is, members of dominant social groups seeking out cultural and social values from marginalized people using a variety of practices from hiring to citing a marginalized person's support of dominant social groups' behaviors and policies. Identity capitalists make superficial gestures toward diversity, equity, and inclusion for financial and cultural capital without causing real meaningful change in the systems that oppress marginalized people. Identity capitalism is reminiscent of the operations of racial

organizations who deliver just enough resources according to racial schemas to satisfy diversity, inclusion, and equity advocates, or at least counter criticism from diversity advocates. I addressed this idea briefly earlier in the chapter. For Alex, tech sponsors only deliver resources to Clearwater Academy so they can either exploit the coding literacies and identities of the adult learners they do hire or add Clearwater Academy to a list of initiatives that show their commitment to diversity.

Although they questioned the depth of Clearwater Academy's sponsorship, Black adult learners nevertheless wearily accepted the necessity of turning to majority-white tech companies for support: they possessed the best resources and wealth in town. Kevin, another participant in the spring 2017 group interview, acknowledged this reality when his responses combined Alice and Alex's perspectives. But he later considered the consequences this relationship had on them as adult learners: "I like what they're kinda doing," Kevin explained to his peers, "but I hate the fact that they gotta show me off to people. That they're like 'Hey, look at this new Shiny POC who can do all this stuff. Come look at him! Come look at him! He's nice and strong! He knows his code!' You know what I mean? I hate that stuff." Kevin's imaginative take on presenting the Black coder to white developers recalls images of enslaved Black people standing on auction blocks for white slave masters in the antebellum South. While on display, the seller—in this case Clearwater Academy—names a list of computer programming languages they know and the various programs or websites they've built. Tech companies then bid on who they want on their tech plantations. That language is harsh, but it nevertheless reflects Jessica's point about getting a job according to white standards, which means following the social engineering that removes many Black behaviors that wouldn't be desirable to white employers. The language—tech plantation—also brings Kevin's metaphor to its logical conclusion. What Kevin calls the Shiny POC is the Shiny Black Function, the outcome of Clearwater Academy's curriculum and assessment, even though that is not the intended philosophy for training racially marginalized people in software development.

Another critique adult learners launched against the social reproduction project at Clearwater Academy was that they found they weren't learning computer programming in a dynamic, sophisticated way; that had serious implications for their prospects on the job market. Above, I explained that functions take in data and perform some act; functions *can be* complex, such as taking in other functions to perform actions or containing many lines of code to calculate problems. Kevin jeered earlier that the Shiny POC knows their code but based on the computer code bootcamp's curriculum and assessment model, the Black function has none of these complex features. The Black function comes packaged with simple lines of code to execute for white

software programs, leaving undisrupted its contributions to the racial system tech can serve.

Black adult learners had high hopes for the program at the beginning of the semester. Rania had learned graphic design and HTML years ago in Atlanta, so coming to Clearwater was like "starting from scratch." She had hoped Clearwater Academy would be "a great opportunity, a new start, … so when I read about it, I said, 'Oh this is gonna be good.'" But once Rania got deeper into the semester, she found learning programming challenging mostly because she and her peers had to work on their coding without much direct instruction. "You really have to practice every day to really understand it and get it. You really have to practice and study because if you don't, you're gonna feel lost every day." Although Rania struggled with exercises in FreeCodeCamp, other Black adult learners found the work unsatisfying and not teaching them enough. "FreeCodeCamp doesn't teach you programming language," Alex, from the Spring 2017 class, explained. "It teaches you how to follow instructions and decode instructions in order to get past those problems." Kevin likewise found Code Academy too rudimentary: "It was the dumbest thing in the world; you didn't learn anything, because it was like 'This is how you use it. This is what it's used for. And this is what we want you to do with it.' So you just copy. Paste. Change one or two letters or words. And it's correct."

However, by the time they started doing exercises in Python and JavaScript, the challenge and pace shifted: FreeCodeCamp, for example, gave adult learners an example but no further guidance. *Less guidance* in problem-solving probably aligned more with what Alex thought was the correct way to learn coding: "Coding, writing code, teaches you how to code. You gotta write code that does shit and you gotta write code that fixes it. That teaches you how to code." What he and his peers wanted to learn was not what a karate chop looks like, but rather "here's how to do a karate chop; here's where you use a karate chop; this is why you use a karate chop." To become better coders, adult learners had to take their own initiative, finding new ways to use what they learned in FreeCodeCamp and Code Academy, or sometimes learning a separate computer programming language on their own, such as Kevin looking into Apple's Swift for iOS programming and Rania using YouTube to expand her knowledge of HTML and CSS. But that's what Richard *wanted* adult learners to do: learn how to learn, use HTML and CSS as a gateway into other computer programming languages. But this knowledge wasn't as intuitive to some Black adult learners as to others.

In the fall semester focus group interviews, Pierre, the most vocal participant, understood where Richard was coming from; he agreed that they must learn and practice computer programming on their own time or "you will feel lost." But Pierre said he felt "owed instruction days [because] I spend so much

time. I wish there was more of a teaching aspect like 'Hey, this is how arrays work …'" Direct instruction would provide him with other benefits, too: While Pierre did practice and study web programming through FreeCodeCamp, he was not sure how well he was doing because instructors did not go over the exercises in class. Without consistent feedback during the class, Pierre only felt more wary of his ability to do well as a software developer. Myra, also a participant from the Fall class, expected direct instruction because they were physically in the classroom to learn web design; if YouTube alone was the teacher, why attend Clearwater Academy? To underlie the importance of direct instruction in computer programming, adult learners in the fall class agreed that their favorite day was Tech Tutor Day: a day when professional coders would visit the class and work one-on-one with adult learners on their coding exercises in FreeCodeCamp. "We need to be spending time doing the technical stuff," emphasized Pierre, but in-class time is instead spent doing "activities, résumé stuff."

Pierre wasn't exaggerating. During my participant observations, I saw adult learners spend up to three weeks on learning how to write effective résumés and doing icebreakers that, to Pierre, felt like high school work. In the words of Alex, from the spring 2017 class, they came for computer programming and instead "got a lot of bonus stuff. Five percent of the class was useful; I did not sign up for employment training or this structured approach to teaching; showing up to a place like it's a job and you're not getting paid for it and taking a lot of grief while you are here."

The learn how to learn pedagogical strategy left adult learners unsure that they could do well when applying to jobs after graduating. As an example, adult learners in the Fall semester class mentioned playing a Jeopardy-style game so Richard and Jessica could test their coding knowledge. The activity came ahead of mock technical interviews with recruiters when adult learners would answer questions and complete exercises to show their knowledge of web design. The adult learners failed the test; no one knew anything despite practicing coding exercises online. Richard was embarrassed; the adult learners would reflect badly on Clearwater Academy when they began mock technical interviews. They seemed to have spent too much time on appropriate body language and eye contact and trying to learn how to talk in a corporate setting. They didn't learn enough, but they, as Myra explained in our group interviews, "can give you a whole rundown on how to talk."

Not knowing code placed a new burden on Black adult learners at Clearwater Academy. Pierre was the most explicit about this problem in his class' focus group interviews. Ideally, he would like to say, "Hey, hey, I can do the same things in the same way you do them and I'm a different color skin." This looks like leveling the playing field for Black people. But the opposite seemed

more likely after graduating: "Hey, I'm a different skin [color] and I don't talk like the rest of the [white] people assume that I speak. Yet I don't know [coding] but I can talk with you … It's intimidating being a person of color … I'm a person of color *and* I don't know shit." In other words, it seemed that rather than being a professional Black coder prepared for working in tech, Clearwater Academy would confirm in some instances the racial schema that Black people do not know code or cannot learn code; recruiting Black coding literacies seems like a bad investment after all. Only some exceptional Black adult learners—Shiny POCs—should accrue the resources of tech for financial well-being under the rubric of whiteness.

While Pierre felt the weight of racism and coding, there were hints of aspiring to be a Black function: doing as well as white coders with only difference being a Black person still suggests respecting coding literacy as white property. To grasp it and hold it, you must not cheapen its quality; you must honor it the way white coders honor it. Aspiring to this standard implicitly remains consistent from the spring class of participants, who tried to push back against Alex's suspicion of the tech company's motives. For example, Alex drilled on the point that they had only learned a skill, and a skill on its own could not topple institutional racism: the problem of racism is too gigantic for tech to solve. Isaiah, however, thought that how tech sponsors felt about training and hiring Black coders didn't matter: "If you can show them your skill with coding, people can't say anything against you if you're good … You just killed them dead. They can feel any type of way they want [about diversity and inclusion], they cannot say 'Oh you are horrible at this. I still feel the same way.'"

Isaiah tried to reconcile what they saw happening in Clearwater Academy by appealing to the merit of coding literacy practice alone. But this appeal suggested their becoming Black functions again: one who is good at coding according to the expectations of the tech culture. While the skill itself may show the Black coder an asset, the employer still had a docile coder who did well but left racial schemas and ways of distributing technology to the public according to white frameworks uninterrupted. True to racial organization theory described above, this kind of Clearwater graduate won't demand that the tech culture needs to change.

But the relationship between Clearwater Academy and tech sponsors is uneven; the power dynamics favors tech companies and their notions of a good employee. Because they have the resources and capital (and job positions), tech sponsors have the power to shape the priorities of a computer code bootcamp's approach to race and racism and how coding literacy works towards those ends, not vice versa. When the curriculum and assessment of Clearwater Academy draws on the resources and sociocultural expectations

of tech companies, the computer code bootcamp programs Black coders who uphold whiteness and coding literacy as white property. They learn this orientation through employability skills but also in computer programming where they follow instructions as given on the screen. Learning computer programming beyond HTML and CSS is encouraged and expected, but the behaviors matter most.

The point of interest here is how Black adult learners and equity-minded instructors feel the weight of the tech industry's racial schema as they use their resources; they understand how racial systems fuse with the project of Clearwater Academy and they wrestle with this program while desiring to break this philosophy of coding literacy learning, even as they must go through that program to succeed. What would it take to rewrite the process of programming Black functions and revise the structure of computer code bootcamps as racial organizations? I take up this question in the final section.

"From a Ripple Effect to a Wave": Advocating for Black Coding Literacy

The public discourse that drives democratizing computer programming education for work hinges on the logic that few Black people work as software developers in the companies that have created and shaped the infrastructure of our digital lives. Coding literacy may help address the legacy of poverty and social exclusion for Black communities. Computer code bootcamps and their relationships with the tech industry can perpetuate the problems the coding movement intends to address, as demonstrated in Black adult learners' and instructors' conflicting reflections on curriculum and assessment practices in Clearwater Academy. Addressing poverty and diversity, equity, and inclusionin tech requires a direct attack on the redundancies of white supremacy. In my focus group interviews, Black participants cared little for these macro-level issues and outcomes. When reflecting on their participation in the coding movement, adult learners instead imagined personal outcomes, what I consider a working vision for Black coding literacy as transformative access (Banks, 2006).

First, some participants acknowledged the realities of going into tech as "early adopters" of the computer code bootcamp model; they were not the cohorts that would witness racism end. Even though Richard and Jessica did not always explicitly discuss racism, the adult learners knew from lived experience what they would be getting into if they did work in software. Speaking in the spring semester, Kevin expected "lots of awkwardness. There's not going to be many people of color [when I get a tech job]. I'm going to jump into a pool of people who aren't gonna want me there. Just dealing with that,

I'm mentally ready to deal with that." Zeus, speaking for himself in Fall 2017, thought he would feel "eyes on the back of my head. People hovering over me because I'm Mexican, and they know that I'm coming with only HTML and JS. It sucks. But more fighting against discrimination. I feel like it's not even direct discrimination—that indirect indiscrimination." Kiesha had the dual problem of racism and sexism, as she witnessed firsthand from visiting one of several Meetups that adult learners could attend to get points. "I don't hear about breaking ceilings at the meetups," she explained. She referenced meeting a woman developer who had 15 years of experience at her company. She fit in just fine and was nice, from what Myra could tell. But this coder never went up the ladder. And she was white. Feeling the weight of race, as well, Myra assessed her prospects in this way: "I look like nobody in the tech field; I have long nails, but I can type my ass off; I have weave down to my back but that don't determine who I am." And, yet Myra could not escape the feeling that her appearance—and lack of knowledge of some computer programming languages—would determine her success. Or failure.

Alex summarized the above thoughts eloquently:

> If you teach a man to fish, you have taught him a skill that is going to increase his chances of survivability. But it doesn't give him privileges like white people. Does learning this skill help me or the African American community? No. I could have learned any other skill that would provide a means to make a living. The mass distribution of this technology impacting African Americans? Probably not. It wasn't one thing that caused how we see African Americans. We need more than just coding to see the impact. Just because you learn how to code, and interview well doesn't mean you know how to placate white people.

Racism has too many moving parts for coding literacy alone to fix. They can dress up as Black functions as much as they want, but they don't expect the cultures of tech to be any different from what they find elsewhere.

However, participants did see their learning at Clearwater Academy the starting point for a macro-level trend toward equity and anti-racism in tech. What came to light in the spring class interviews especially was the notion that so few Black people are seen as software developers. Participants in that group agreed that they were "outliers. We are not the typical [Black] people," according to Alex. For them, Black people have not always shown interest in understanding how tech works. While Black communities are happy to use digital technologies, participants thought their own people didn't have the stomach for building those technologies because coding looked too

complicated. Everyone seemed to have a story about meeting a Black person who seemed technophobic. Consider this exchange: Alex recalled hearing "about a mother from the last cohort who tried to get her daughter into this [Spring 2017] cohort. She's a Black girl; she's not technology inclined. She said that 'computers are smarter than me.'"

DeAndre chimed in, "If that ain't about the dumbest——you control the computer, the computer is about as smart as you are."

"Not for our people," replied Alex. "I think our people think the computer is smarter than they are because they don't … they don't know that the computer only says yes or no. True or false. Zeroes and ones."

On one hand, I find this perspective misaligned with other accounts of marginalized people's relationship with technology. Political scientist Virginia Eubanks (2011) in *Digital Dead End: Fighting for Social Justice in the Information Age* worked with diverse low-income women at a YWCA technology literacy program; women in this group, including Black women, were hyper-aware of how city governments that deployed technology to help the impoverished were also methods of surveilling those same poor people. And historian Charlton D. McIlwain (2020) documents decades of Black engagement with technological systems, as well. I don't, and cannot, however, discount the lived experiences of Black participants in these interviews. Within their local communities, in their relationships with other Black people, they consistently found reluctance among the young and old to participate in the designs of software.

Becoming the first of a few Black people learning coding literacy still set them as role models for their community. Rosie observed that many trailblazers had come before them; everyone in the spring semester class was joining in that rich tradition of trailblazing Black people. With coding, Rosie explained, they can "leave a mark in the world … Everyone at this table has the opportunity to make a change in this world." Clearwater Academy's challenging racism and poverty had to be long-term and ongoing, but the Black adult learners in this study could at least be "a ripple effect," and with more Black people entering tech through computer code bootcamps they could later become "a wave," according to Rosie. However, it's not just themselves they considered making that wave. Clearwater Academy also had some responsibility in making this wave possible. The computer code bootcamp must rely on majority-white tech companies because, as explained before, they have power and resources to mete out how coding literacy gets taught to Black adult learners. Kevin hoped that Clearwater Academy would later seek partnerships with the admittedly less powerful Black-owned tech companies (once again evoking the principle that Black-owned organizations do not have the same position in a racial organization system) and no longer rely

on the money and resources of their tech sponsors.

Participants seemed to have less interest in fixing tech itself at this point in the history of mass coding literacy, and more interest in using coding literacy to better themselves and their community. This was the answer to Alex's point made in the previous section: yes, there is no white privilege with computer programming, but the work here isn't about white people in tech. As Rosie clarified to Alex, and as Isiah agreed with her, "It's about what *you do with the information you have*, and you don't want to be your own worst enemy. … You just gotta keep on pushing past that … What are you going to bring for you and your family?" Others did ruminate on the possibilities after graduating from Clearwater Academy, goals that became increasingly local and personal to their individual context.

What would Rosie do with the information and resources she gathered from Clearwater Academy? As a fifty-eight-year-old Black woman in early retirement, Rosie thought she could later become a bridge between elderly Black people like herself and the technologies they use, or don't use. Having decided to be a freelance web developer, Rosie followed Richard and Jessica's suggestion to think of three people or organizations she could do business with. This idea seemed necessary, especially as she knew many Black-owned businesses did not have a website to reach a wider audience. But more than her own financial benefits, Rose wanted to share her "knowledge to help other people that maybe in my age group—you know, retired or about to or whatever—can utilize these same tools to help them do some of the same [things]." Similarly, Kevin envisioned himself bringing what he had learned back to Arizona where he volunteered with a Black Lives Matter chapter and an LGBTQ+ advocacy nonprofit. "It may not make the hugest impact but increasing the amount of knowledge that a person knows is infinite," explained Kevin. "Because then they can teach their people, they can teach their people, they can teach their kids. I feel like my personal ripple is just helping my community and my kids." As for leveraging computer programming into social mobility, Kevin thought of collaborating with his Blerd (Black nerds) friends and starting a business that offered an Uber-like app service that tracked food trucks in and around his hometown in Arizona. And while we did not discuss to the same extent these small ripples with the Fall 2017 focus groups, Black adult learners did want the program to work and at the very least finish something when they had given up on so many opportunities before. This sampling of plans from the spring class focus group demonstrates great desire for independence from whiteness, and tech could possibly lead to that. Or, as DeAndre put simply at the end: "Don't work for anybody else … I like to be in control."

The participants in this ethnographic study understand the work that must be done to topple institutional racism and believe firmly that computer

programming as a new prestigious and emerging literacy will not bring the necessary machinations to make that happen. As they observe from Clearwater Academy's curriculum and assessment, the project of democratizing coding literacy itself participates in and reproduces the structures of racial organizations. The material, financial, and social consequences of how resources in the computer code bootcamp are distributed along specific benchmarks reflective of whiteness in tech leaves the ability to make real change in tech precarious and uncertain. They can be coded as Black functions that meet diversity, equity, and inclusion in the dataset of who works as software developers, but the structures, logics, and practices of tech remain in place. To promote social mobility and this bare minimum node to diversity and anti-racism, Clearwater Academy graduates aren't positioned to rewrite coding literacy for themselves and change how technologies are designed or how relationships form among colleagues and between colleagues and the organizations they work for.

However, visions of what coding literacy may do for themselves, and their communities, aligns with the legacy of sustainability that's endemic in Black rhetorical and literary tradition. They offer a different logic and possibility, one that centers Black tech companies or Black-owned companies who rely on a team of software developers and other folx adjacent to technologies that make their services and products run. Creating resources around Black money and tech also means creating new models for how computer programming and software design can revise racial organizations. This exemplifies transformative access (Banks, 2006), the idea that access to digital technologies is not only about inclusion but also reallocating resources of computer programming to help Black people rewrite the rules of racial systems to the benefit of all people.

Conclusion

In this chapter I've explored the relationship between racial organizations and how they work together to maintain, and possibly transform, societal racial order. The ready-to-work model in coding literacy creates a path toward diversity in tech while reproducing racial hierarchies. Tracking the flow of material and social literacy resources within and between organizations reveal exactly how these systems work. What I have described in this chapter are Clearwater instructors' and Black adult learners' perceptions on what the computer code bootcamp's partnership with tech sponsors means and what the desired outcome may be. While they appreciate the effort to diversify the tech industry, Black adult learners question how they do or do not participate in the outcome tech companies' desire for diverse coders and who really

benefits; some suspect that they need to be shaped into suitable Black people for white employers: people who can speak well and code well. The curriculum explicitly addresses race in only how it relates to getting a job. Instructors sense they can fulfill the mandate to end poverty (one goal of the nonprofit Social Justice Cooperative) but at the expense of leaving the goal to end racism untouched.

I argue that coding Black functions is a fitting metaphor to describe the kinds of coding literacy practice this computer code bootcamp teaches—coding Black function. It suggests that when advocates in the coding movement racialize the call for more opportunities for learning computer programming among historically excluded communities, they must ask what they mean when an institution with all the resources of coding takes responsibility for training these communities. In what ways do existing institutions, upholding certain views on race, recreate Black coders into systems of whiteness? Even an emphasis on the logics of coding through strict focus on web design itself can help maintain racial organizations and implicate Black coders in leveraging their coding literacies for these goals and outcomes. Coding Black functions calls for caution and the need to consider alternative logics rooted in Black lived experiences and knowledge that rewrite the possibilities of what racial schema of computer programming resources can look like. Black adult learners' discourse about their participation in racial organizational power suggests what those alternatives are: in their view, a Black tech ecosystem surrounding and flowing through coding literacy and vice versa would highlight their specific needs, not the needs of tech, and training in computer programming and its many possible career trajectories would rely on Black tech funding. Both would disrupt leaky pipelines from computer code bootcamps to work and diversify the many ways Black adult learners might code themselves.

Chapter 4: Coding Literacy Echoes in Black Lives

> Anything that comes quick and fast, leaves and goes just as early.
>
> – Rapsody, from the Netflix docuseries *Rapture*

> Sometimes you don't survive whole. You just survive in parts. But the grandeur of life is that attempt. It's not about that solution.
>
> – Toni Morrison

On a cold morning in late March 2017, adult learners gathered in the classroom and started the next day of their training with the stand-up ritual. Richard and Jessica asked each adult learner to share what they hoped to get out of tomorrow's tour of a company that offers help desk software to businesses. Tours of tech companies were opportunities to learn from professional software developers and managers and get a glimpse of shiny offices that mixed business with lavish perks. I would join the class on tour of a different company that overlooked downtown Sakowin. Just across the hallway on the other side of a wall was a break space with arcade games, billiards, a kitchen, cupboards full snacks and mini fridges with drinks. Touring a tech company was also a chance to impress someone working for the company. Networking was at the forefront of Alex's mind. He interrupted stand-up with a question about his "personality quirks." Alex told Richard and the rest of the class that he can be "blunt and frank … How do you deal with that when you network?" Richard, taking command of the front of the room, responded, "Practicing performance. Create a character. I know my background, my [body]size … Who you are depends on what you want people to see you as … You need to convince people." Later that day everyone was scheduled to practice elevator pitches, so Richard used that activity as an example of being who you need to be for clients and employers. "What gets you the job is communication," explained Richard. "Selling yourself. Everything else is just work."

He himself was quite familiar with putting on a performance to attract business. In the 1990s, Richard designed free websites for friends. As one of the few Black web designers in the country at that time, Richard wanted to get into the "white business world" where he knew lots of money awaited. When he lived in Indianapolis, Indiana, Richard hired a tax attorney who happened

to have connections to white corporate America. He also had a terrible website. In their first meeting, Richard offered his services to the tax attorney, pointing out in a joking and professional way that the attorney's website could use some work. The tax attorney made no excuses: he agreed the website was a mess. Finding common ground on their reality, Richard shifted the conversation. If the attorney helped with Richard's taxes for free, Richard would redesign the website in return. A month later, the tax attorney approached Richard with good news and bad news. The bad news: Richard owed taxes. The good news: He knew many other certificated public accountants who needed websites. Over the years, Richard's reputation grew such that clients came to him by referral. The elevator pitch, Richard reasoned, was a brief space to say what you need to say to get the job. "If you can take away people's pain, you make money."

But taking away pain with carefully designed websites and mobile applications was only part of the story. Richard knew well what he was asking Clearwater Academy adult learners to do: like him, they should enter white corporate America. That's where the money was. That was where social mobility was. That was where their digital literacies would best serve them. Richard admitted that there was a higher bar to climb when you're a person of color. He was blunt: "Show them that you can work with a team of white men because you are competing for jobs made for white men." That should not terrify them or push them away from the job market in the tech sector: they needed to be the face of the economy. Richard continued his lecture: "Services and goods need to be made for marginalized people and without those people in the industry, those services and good will never be made. If you avoid the company, nothing will change." Richard had to transform himself to stave off discrimination: He was a tall and large Black man raised in a Muslim family. The terrorist attack on New York City on September 11, 2001 made the cultural and political climate too hot for Richard. He changed his name to compete for white clients and navigate around their suspicion that a freelance designer with an Arabic name can't be trusted with their technology. And yet, at the same time, Richard and Jessica emphasized agency, control over the job market. There was no easy answer on how to be a professional. When you work with a client you must ask, "Who do you want to attract?" As professionals, Richard explained, that's a "decision you have to make for yourself."

Richard's lecture represents several themes germane to this chapter. First, Clearwater Academy's curriculum teaches coding literacy and employability skills, but Black adult learners can't filter out their racial identity, political affiliation, and how others perceive them. Their worth as coders gets bound up in social and political ideologies. Black adult learners must practice performative rhetoric to shape employers' perception of their race and literacy practices. This

theme recalls Chapter 3 where Black adult learners sensed they had to put on a show for majority-white tech companies, an additional burden to an already difficult job market. But a second theme emerges from the lesson: Their coding literacy practices afforded them many possibilities for the kind of professional they wanted to be. Black adult learners can navigate the world with the confidence that they have worth and dignity. Being Black and a coder can take you places. So there's the difficult mix of coding literacy on the job market: The realities of racism and needing to create a racial brand identity that does *and does not* center whiteness in the work life of Black adult learners.

In this chapter, I argue that while coding literacy itself does not help Black adult learners overcome sociomaterial and cultural barriers to social mobility, the coding literacy they learned—its practices and knowledge—continues to echo in their lives in other ways and promotes some sustainability. I contend that coding literacy education for work is a clarifying tool for Black adult learners. The unique qualities of coding literacy (the processes and knowledge they've learned mixed with their own assets) brings clarity to where else they can accumulate digital literacy and to the directions Black adult learners may take their labor and skills on their own terms. As a clarifying tool, computer programming promotes agency for Black adult learners in general. This clarification on literacy and labor comes with baptism by fire, however. As they begin their post-graduation journey on a job market that seems rife with potential jobs in software development, Black adult learners discover how racism persists in tech, how too slow the industry moves on hiring them, and how, when the industry does finally hire them, judgements on Black adult learners' value continue to be overlooked or ignored. Other personal circumstances determine how they move in the economy with such a prestigious literacy. Just as their worth as coders are being judged by tech, Black adult learners in this study make judgements about tech and computer programming. The institutions that structure and judge their worth provide clarity on their identities as literate workers and their position in the economy. These institutional and social structures shape how their literacies develop. The value of coding literacy begins to unravel for Black people. The pipeline to prestigious work and social mobility, so evident in discourse on vocational literacies, remains leaky for many. Some fall through these holes from the start or they never enter the pipeline. Participants *do* land in other pipelines, some of them they created themselves. Sometimes the tools of coding literacy echoes, and other times Black adult learners lean back on their own assets and communities. Where before, I would say, they had some cloudiness on what to do with literacy and work, after they experienced coding literacy, and after interacting with its sociocultural forces, they discover logical processes toward finding new possibilities.

I use post-graduation interviews as the basis for my argument. Built into my study design was an effort to keep track of what participants did after finishing Clearwater Academy. My longitudinal study was very small and modest, given the time constraints of my writing: check-ins three months and then six months after finishing Clearwater. I focused on these specific, quick turn-around updates for another reason: To put to the test the discourses of Clearwater Academy, and other computer code bootcamps that followed a similar model, that suggested adult learners *may* get a quick return on their investment with a paid internship or full-time work. As a qualitative researcher of literacy, I was less interested in the success of getting a job and the speed in which that job came and more interested in learning the ways adult learners develop their coding literacies further across different locations where others make judgements on Black adult learners' worth as human capital and where Black adult learners make similar judgements about themselves and the industry.

All participants agreed to do follow up interviews and gave me their email and phone numbers. However, as is common in longitudinal studies, most of the 12 participants were difficult to contact. Some I followed up with three times, such as Isaiah; many only once at the three-month mark but not again at the 6-month mark, like DeAndre. Rosie, I interviewed twice and nearly a year after she matriculated into Clearwater Academy. Thus, most interviews occurred throughout 2018 and into 2019. I'm fortunate that even three-month check-ins lead to rich details that could interlock with interviews that covered longer trajectories, creating as complete picture of their lives after taking up coding literacy practices as possible. I include one 2018 interview with a Black adult who had graduated in 2016, a year prior to the start of my study.

This chapter covers the post-graduation life of Black adult learners. I break them up into three groups of graduates with interlocking themes about coding literacy's influence on prospects for social mobility and navigating racism: Four stepped away from software development; two succeeded with paid internships but dropped out of software development by the end of their programs due to microaggressions and stereotype threats. This chapter uses interviews conducted with those participants three to twelve months after graduating from Clearwater Academy. I find that a year is too short, so I include two unique interviews: one interview I conducted with a full-stack developer who had graduate two years before my 2017 study. The second an interview with Zeus who had "disappeared" in 2018 and then unexpectedly returned to my attention on Snapchat five years later. My January 2023 interview with Zeus covered his post-graduation life since 2018. His longer trajectory was a welcome and rare find that highlights the downstream impact of a computer code bootcamps on one person's journey through the economy. In total, my interviews cover seven years of individual lives: 2016 – 2023.

Although just eight participants, the variety of exposures to these Black adult learners through interviews provide rich details on coding literacy's echoes in their professional and personal lives. In addition, by considering each type of career trajectory post-graduation, I show how they move from context to context, from work without computer programming to having no job at all, for short term literacy development and long-term literacy development.

I've designed a chart in this chapter that provides a snapshot of the variety of directions Black adult learners went after graduating. I include participants whom I did not formally interview but rather, curiously, happened to bump into during my day-to-day activities, like walking down the street, visiting a coffeeshop to write, or visiting a bar with friends. These are brief touchpoints that, although not super detailed with context, glean what happened to them after graduating. For example, I met Pierre in a downtown coffeeshop in summer 2018. He was behind the counter handing out drinks to customers. After we exchanged some pleasantries, I suggested we meet and catch up some time. Pierre's response has stayed with me all these years later: "I gotta go and finish making these drinks." In Chapter 3, Pierre had expressed concern he wasn't going to have enough experience with coding literacy to get a job, and in Chapter 2 I wrote that he had learned from a Clearwater Academy graduate that he needed to be patient—a software developer job will come soon. His position after graduating from Clearwater Academy six or seven months before had not deepened his place in tech industry, where opportunity and creativity abounded for others. The response to my suggestion that we chat reveals another layer for why I had not re-connected with all participants: shame. The idea had not occurred to me until 2023 when I interviewed Zeus. He was still in contact with Pierre, and Zeus speculated that maybe some people read my emails, text messages, and calls, but *they didn't want to pick up*. They had not done anything with computer programming, and they thought I was looking for that exact thing. "Some of them," Zeus said, "were probably sorry that they could not help you more." But I show in this chapter that it's not their fault. And that they have done better.

First, I discuss the precarity of employment and earnings potential for Black adult learners in the United States. That section begins at the high-level before zooming in on the job market for software development. Sociologists, I observe, agree with what literacy studies has long known about digital literacy and what its acquisition does and does not mean. But I draw a positive throughline to find a more nuanced take on what Black adult learners who have gained coding literacy do on the market and what they do for themselves. Then I show how Black adult learners navigate the job market; wrapped around these decisions are the judgements made about their worth as coders in tech, the judgements they conclude about themselves in relationship to those judgements, and even their own conclusions about computer programming itself.

Table 4.1 Job Placement and Education of Black Adult Learners in Order of Graduate Year

Participant	Year of Graduation	Job Placement	Education
Gerrard	2016	Full-stack developer	Certificate training in cyber security
Alex	Spring 2017	Director of Communications	---
Alice	Spring 2017	Credit union document designer	Seeking associate degree and IT certification
DeAndre	Spring 2017	Freelance web designer	Seeking associate degree and IT certification
Isaiah	Spring 2017	Web developer intern; stay-at-home artist and father	Completing associate degree
Kevin	Spring 2017	IT help desk	Seeking IT certification
Nadine	Left Clearwater April 2017	Reportedly houseless	---
Rosie	Spring 2017	Continuing retirement; community volunteer	---
Myra	Fall 2017	Certified nursing assistant	
Rania	Fall 2017	---	---
Pierre	Fall 2017	Barista	---
Zelda	Fall 2017	Web developer intern	---
Zeus	Fall 2017	U.S. Army IT specialist	Seeking cybersecurity certification

The Job Market and Shaping Black Coders' Literacy Development

What do Clearwater Academy Black adult learners enter after graduating? In Chapter 3, I highlighted hiring practices. Here I dive deeper into data from sociology that shows how institutional racism determines how Black adult learners experience the job market. In other words, I take the perspective of the job prospect, not the hiring manager assessing their value through coding literacy practice. Although computer code bootcamps, and other short-term programs, promise a significant rise in social mobility, the job market has been fraught with inequality between Black and white workers in the decades since the Civil Rights Movement. In the wake of the Civil Rights Act and

affirmative action, the Black unemployment rate since the 1970s has remained stubbornly high, even in moments of economic prosperity. With a college degree, or additional graduate degrees, employment fairs better for Black adult learners, although their earning potential still drags behind white people. Yet even controlling for educational attainment, the earning rates trails white workers (Rodgers, 2019). Experiences on the job market worsens for Black adult learners holding only a high school degree, which for many Black adult learners in this study have with some college education. The criminal justice system is more likely to cut off access to high-waged work, especially young Black men who commit non-violent drug offenses (Loprest et al., 2019). The examples above are just two puzzle pieces of a larger narrative that's difficult to pin down; there's no single way to explain racial inequality in employment and earnings, but that perhaps indicates how structural racism works: a massive web tangled in different ways across education, housing, healthcare, citizenship, and other institutions.

The job market for software developers suggests it can carve out a safe space for marginalized people—where talent and merit become the basis for employment and earnings. Across a variety of roles in the technology sector—data science, cybersecurity, database administration, web development, information research, and IT management – software development is projected to grow by 23 percent over the next decade (2022 – 2032). To place my 2017-2018 study in context, the US Bureau of Labor Statistics expected employment in software development to grow by 25.6 percent (Dubina et al., 2019) yet only 4% of Black coders will share in this latest projected growth; in addition, the same 2023 report shows further that the wage gap between Black and white developers persists in tech.

While race and gender discrimination limit the opportunities of marginalized people breaking into tech, geography adds another layer to the uneven distribution of highly coding-literate Black people. Tiffany Chow's work has been instrumental in helping me think about how place and space bind to coding literacy and social mobility. As I show later, for some Black adult learners, geography is a major factor in their success on the job market. Degree-holding computer science graduates focus their job search on "brain hubs"—cities that have a high concentration of tech companies and a dense pool of potential hires, such as San Francisco, California; Austin, Texas; Seattle, Washington; and Raleigh-Durham, North Carolina. Chow writes that these hubs "[confer] real advantages, such as job matching, career specialization, and higher salary, for those graduating with a computer science degree and who want to secure a job matching their degree" (2022, p. 4). However, tech companies and Silicon Valley do not always expect coders to come to them; they spread their enterprise throughout the country and create regional

offices to exploit regional coding literates. Extending these findings, Chow surveyed alumni from three Texas universities to discern how an educational institutions' proximity to a major tech hub city determined the successful hiring of Latina computer science graduates. Chow found that "alumni from universities near a major tech hub are more likely to earn higher wages in desirable job markets compared with graduates from a university located far from a dense tech hub" (2022, p. 14). The study shifts conversations on the value of coding literacy for social mobility: Whereas the original discourse on computer programming suggested that coding literacy alone will be necessary for the economy, geography adds an asterisk. Where did you study? What resources were available at that institution? How far away are those resources from a dense tech hub city?

Geography and its association with social mobility echoes a lot in my own study at Clearwater Academy. During an interview over summer 2017 between semesters, Jessica worried that Sakowin had "a mini brain drain." Sakowin had a vibrant startup culture, and Sakowin University, although not near a major tech hub, had social and material resources that could send its graduates to internships in, and eventually work full time for, Silicon Valley. So college graduates keen on honing their coding literacies could exploit the startup culture and then leverage both college coding literacy and small business experience for high-paying jobs (relative to cost of living, of course) in San Francisco or Austin. The brain drain is hard for tech companies in Sakowin, so they do need a backup pool of coding literates, people they know will stick around for a long time and not run to Silicon Valley. Clearwater Academy graduates were not going to go as far as a college graduate; that Black talent would stay in Sakowin. Clearwater Academy was designed with their reading of the tech job market. Clearwater Academy's adult learners didn't dream of making it big. Most, Jessica explained, wanted to go into gaming, which she called an "exclusive industry" all on its own. Fewer, in her experience, have dreamed of Facebook or Google. Richard reeled in these big dreams early and often in the program. He explained,

> The level you can compete at is not where you would be at for that kind of job, competing against people who have been in college for the last ten years to do that one specific thing they're applying for. Fourteen weeks is not gonna compare to that. That's a fact. It's just impossible. I feel like if I'm not honest about that, I'm setting them up to be dreamers. And I have realistic expectations about what they want to achieve and the amount time it takes to make it happen. Because if you think you can make it to Google next year, expect to have

> a mop and broom, unless you got the skills you learned outside of class.

The closest Sakowin had to a tech company on the same level as Google was a local healthcare software company. It was notorious for having low retention for new hires: the company often hired young college graduates from the local university and burned them out in two or three years by sending them across the country to consult with hospitals. They would make plenty of money, but their bodies and minds would be wrecked. Richard and Jessica knew no Clearwater Academy graduate would work for that company, at least not as a software developer.

If they weren't fresh out of college, they were recruited for their years' long experience in tech. Recruitment into a top-tier company was the most likely pathway for a Clearwater Academy graduate. In fall 2017, a white alumni visited class to speak about her extensive experience on the job market. She had graduated from one of the first classes of Clearwater Academy and worked her way through small companies in Sakowin. The accumulation of coding literacy experience increased her worth as a coder to the point she no longer needed to apply for jobs. Tech companies came to the graduate via LinkedIn hoping to recruit her. Her hard work at the bottom finally paid off. She was happy to announce to the class that she was moving to Austin, Texas to be a software developer for a big company. But there was plenty of work and plenty of money to be made in Sakowin; that's where Clearwater Academy graduates should think about. What I find then are multiple hurdles: not just race and gender and the sociocultural knowledge that comes with computer programming, but also job opportunities according to geographical location. All of these become sources of judgement for Black adult learners in this chapter and shape their attempts to obtain social mobility, just not according to the purposes of a computer code bootcamp like Clearwater Academy.

The uneven benefits from coding literacy would not be a shock for literacy scholars. For over two decades, New Literacies Studies has found that literacy is a weapon for structuring stratification among marginalized and dominant social identities (Street, 1984). Even as a material object that moves across borders, literacy participates in regulating how people migrate or build literacy practices among families (Leonard, 2017; Vieira, 2019). These findings hamper the (digital) literacy myth, or the persistent belief that literacy acquisition is necessary for economic development, democratic practice, upward social mobility, and other social markers of advancing toward progress and potential (Graff, 1979; Shapiro, 2015). As participants shared in Chapter 3, changes in policy and practice challenge institutional racism and produce opportunities, not the acquisition of coding literacy. What's left between these

two commonplaces? What ignites, animates, and excites literacy scholarship are the nuances of literacy practices, and not just the patterns that occur but it's vast differences, complicating the narratives that persist and simplify how we engage with literacy and how literacy engages with us.

Previous research on a more realistic hope of literacy in Black communities guides this chapter analysis. While literacy scholars have called for investigating how the literacy myth influences policy, pedagogy, and curricular design to reach overblown goals, that does not preclude that we should lose all hope in literacy. The Black version of the literacy myth paints a subtle difference. A historical study on Black literacy learning in the 19th century and early 20th century demonstrates that profound belief in literacy's power to liberate drove Black people to learn how to read and write (Bibbs, 2011). Those desires carry forward into coding literacy; as Black people interact with the social and material resources of computer programming, they demonstrate a "rhetorical practice of finding comfort in and celebration of" strategies for approaching technical and professional communication. These strategies point to different affective principles that guide Black adults' decisions to engage with those resources (Byrd, 2022, p. 299). The outcomes for Black adult learners in software development are indeed alarming, but they don't cover the entire story of the pivots they do make in life. Often "success," in the context of computer code bootcamps, means a person has become financially whole. On this note, I'm reminded of Toni Morrison's wisdom. In 2001 she joined The Connecticut Forum to discuss literature and race. Moderator Juan Williams asked one audience member's question: "How do you survive whole in a world where we're all victims of something?" Morrison replied, "Sometimes you don't survive whole. You just survive in parts. But the grandeur of life is that attempt. It's not about that solution" (CTFORUM, 2020). This final chapter makes that observation concrete: to document Black adult learners' survival in parts after graduating from Clearwater Academy, to focus on the attempt, and not any binary measure of success and failure.

The chapter charts paths of collective literacy development over Black adult learners' professional lives after Clearwater Academy. Although not using the theoretical tools or methods of lifespan writing from the outset, my attention to post-graduate life does echo with the mission of this writing research. Lifespan writing research conducts longitudinal studies on how writing develops using the lens of human development scholarship. Scholars study how individuals use "unique prior experiences and resources to identify, understand, and act in each new event, thereby further developing through the solving of new writing problems." Collecting "adequate situational data, we can see writing growth taking place as a response to social situations and demands, and formative of social relations and identities, which in turn provide

further opportunities for challenge and development" (Bazerman, 2018, p. 328). I owe my analysis to Deborah Brandt's insight on how roles in the workplace shape writing development for adults. Her re-analysis of interview data for a separate book—*The Rise of Writing*—shows how "Roles in some sense are opportunity structures for development and, as such, are one of the biggest sources of developmental variation and stratification." We cannot treat professional positions as neutral; rather a role's relationship with power in the hierarchy of work gets wrapped up in stereotypes of social identity and ultimately determine the duties organizations assign workers. "For writers from groups that are often negatively stereotyped or stigmatized," writes Brandt, "these expectations can register as differential treatment leading to a sense of heightened pressure" (Brandt, 2018, p. 254).

The chapter will highlight coding literacy development in the context of economic opportunity, especially regarding the roles Black adult learners vie for. A complex list of pivots occurs across these lives: fail to acquire, obtain but then consider quitting, and actually quit from the roles they had desired. It is the combination of locations, events, materials, racial identity, and communal and familial contexts that make coding literacy echo in other areas of their lives after brushing up against software development, however brief or, in many cases, never at all. What's revealed, again, are the survivals completed in part, and it is in this space we find a more dynamic practice for coding literacy than imagined from computer code bootcamps and software development in general.

Coding Literacy Decay

After graduation a journey begins, a journey to leverage what you learned from a computer code bootcamp into a job with the elites, the ones with hands on the levers of our digital ecosystem: software development. However, after graduating, the structures that support Black adult learners shift as well; all the time spent in computer code bootcamps, and the resources and people they had to keep them going through the bootcamp, end. They must return to inequality full time. But this time they take with them new hope that coding literacy will come just as quickly as the training to achieve a variety of desires. Rosie had taken medical retirement after her lupus diagnosis, so she had no intention of applying for an internship; she had wanted to use coding literacy to "work on my own. Now to have the tools that I needed to start up my own business, you know." However, in the transition over the summer of 2017 and the winter of 2018, Black adult learners found little immediate relief from the rush of poverty. You'll read more about adults like Rosie in this section where perception and expectation of coding literacy run into the realities of leveraging new human capital into work.

To summarize, leveraging coding literacy comes too slow and without much guarantee that it will fit into their lives. Participants deny or put away coding literacy just as, or because of, different tech companies or companies with tech departments denies them. I confirm what literacy studies knows about the limits of coding literacy and its institutions with more nuanced details and Black perspectives on the process. In other words, while Black adult learners do keep themselves humble and go after the lowliest of positions in software development (or do not seek them at all), they still do not appear to be valued and they, in turn, flounder to find value in coding. The multiple ways Black adult learners let coding literacy die out or try to keep alive outside the job market I call *coding literacy decay*. It represents the majority of ways coding literacy did not pull through on its promises. But what's valuable is what happens *after* the decay has happened.

Black Computer Code Bootcamp Graduates on the Job Market

I first take the job market as an important location filled with moments of judgement on Black adult learners' coding literacies. Elevator pitches and mock job interviews were hallmarks of Clearwater Academy's curriculum, where adult learners prepared and then received feedback for their performance from mentors working in the industry. Along with résumé and cover letter writing (also receiving feedback from industry tutors) Black adult learners would be well-poised to perform, to use the limited space they had to, in the words of Richard described at the start of this chapter, communicate they can takeaway someone's pain with computer programming. By the start of my study, Clearwater Academy left adult learners to find and apply for jobs, with the bootcamps offering letters of recommendation for their best adult learners. This already created different levels of stratification among graduates. Of course, the approach also affirmed that Black adult learners had agency over the kind of professional they wanted to be. For some participants, they found the job market undesirable because it proved how little coding literacy could respond to their economic and familial needs. Their perspective and experience on the job hunt left them re-thinking the definition and boundaries of their newfound skills and competencies. These experiences demonstrate that coding literacy, unlike the range of other writing opportunities available to Black people, loses status without a favorable job market. It's too tied to careers, too specialized for labor. The structures that reward coding literacy, supposedly on merit alone, fail these Black adult learners.

DeAndre graduated from the spring 2017 class. While he didn't regret spending three and a half months learning coding, DeAndre found his personal life depleted. He explained his post-graduation experiences to me via

video on Google Meet. On my screen, DeAndre leaned back on his couch and smoked a blunt, which, he said, was the only way to get through the interview with me. "It was a very stressful thing. Like that was stressful, I ain't going to lie to you," he explained. "Me doing that, ain't going to work, that was stressful. So stressful." He worked as a dishwater for a local pizza restaurant throughout the semester, but a month before graduation, DeAndre lost that job. He was physically tired from working nights and mentally tired in the day from coding. Something had to give in that last stretch. Free from the constraints of Clearwater Academy, DeAndre needed a job. He had fallen behind on rent and other bills, so the promise of a paid internship—which usually came soon after graduation—was the solution. The instructors connected DeAndre with one internship; he interviewed for the position but never got called back, never got hired. Turns out, DeAndre had not put all his hope into one position. While interviewing for the internship he used his background in food service to get a job with a Southern Country-themed restaurant as a cook. He would have preferred not to work there because the patrons were "some strange motherfuckers." He continued, "Don't get me started on what they order. Just no. No. Um, no. I ain't going to lie to you—there's some strange stuff that happened one day. The man said he want a double bacon cheeseburger. No bun." In other words, I learned, the customer wanted all the ingredients for the cheeseburger outside of the bun, defeating the purpose of even calling the food a burger. Money was in tech, DeAndre reasoned, that's where he wanted to be, yet that money wasn't going to come any time soon. Money from strange customers with strange food orders was his only immediate option for relief.

When I finally caught up with Kevin in May 2018, I learned he had more luck on the job market than DeAndre in his home state of Arizona. He had not intended to apply for jobs in software development; initially, Kevin registered for another computer code bootcamp to learn Swift, Apple's computer programming language for all of its iOS products. He had settled into Sakowin after just three months of living there and was ready to dive deeper into coding literacy. But Kevin felt a nagging bit of homesickness. His mother kept telling him all was well, but that did not alleviate his uneasy feelings. Kevin trusted his gut: he withdrew from the upskilling opportunity, packed up his stuff, and returned home to where he found his house and family—his mom, adult cousins, aunt, and uncle, and two dogs—in chaos. Looking at Kevin on web cam with his afro sticking up in the air like Fredrick Douglass in his old self-portraits, I would not have thought the return home was so fraught with emotional and mental pain. "Like that's what I came home to," Kevin said. "My car's messed up. Yeah, my house is a mess. My mom is sicker than ever. My house is dirty. I mean, I was just like, 'What is this?'" Kevin spent several

weeks getting his house back in order, including trying to scrape together money to get his truck fixed.

Like DeAndre, Kevin returned to the old job he had since before moving to attend Clearwater Academy: cooking for generous and kind managers, ones who had supported him to leave and come back should things not pan out. He was cashing in on their kindness. But cooking wasn't where he wanted to be. Kevin had worked hard learning coding literacy, and to just go back to working as a cook, left him depressed. Kevin did get some encouragement when he applied for entry-level software developer jobs. He got several interviews, and he put his personality and employability skills to use: Kevin, already gregarious from what I could tell, talked to one hiring manager for thirty minutes, no questions related to the job, just conversation. But when employers moved from being a colleague to being a good coder, Kevin hit walls every time. He recalled a consistent theme for why every company didn't want to hire him. "I didn't have any backend, you know, any real projects under my belt," he recalled. "'They were just kinda like, 'You know, you seem like a great person, but we need you to have more experience.' That's literally what every coding job told me. 'We need you to have a little more experience; get some more projects under your belt and then come back in 4 months when you can re-apply.'"

Kevin was getting a preview into what was at stake for many companies; software is partly about transforming business solutions into code, and code can stretch around the world many times to ease people's pain. Hence, one employer told Kevin that he would have only proven himself to be a potential liability if they let him touch code that was the bedrock of their clients' lives. Projects in themselves would not provide access to a prestigious job as a junior software developer, however, but rather the ability to understand a problem from multiple angles and then program the solution from beginning to end. What Kevin would have to show is not a polished web app or ecommerce website, but rather the potential to solve a problem using computer programming. He had not developed enough projects to demonstrate how his literacy practices fit with these standards. Here's a pattern of needing to learn more beyond the computer code bootcamp. More experience, more knowledge to possess these jobs "made for white people." Kevin felt defeated, saying to me, "And it kind of like—well, with everything going on with my mom, with everything going on in the house, me going right back to the cooking job, it made me depressed. I was just like, 'Dude. I'm just stuck in a rut because I'm right back where I started.' Like literally [Clearwater] was for nothing at that point."

Back in Sakowin, Isaiah had achieved the dream after he graduated in spring 2017: he interviewed for and then accepted a paid three-month internship with a company that provided support and services for credit unions. He

would work in backend programming – the coding that manages stuff users don't see, like data and security. However, at the end of his internship, Isaiah had learned very little backend programming. The reasons I will explore later in this chapter, but I bring his experiences on the software development job market at this point in the chapter because he, like DeAndre and Kevin, desired full-time work in the industry. Even with more experience on the job than his classmates, Isaiah had trouble leveraging coding literacy into social mobility. Isaiah had a baby boy coming in September 2017, and at the behest of human resources he was beginning to leave the internship two weeks before it officially ended. He wasted no time trying to get back into computer programming. Isaiah made significant progress when an insurance company interviewed him for a developer position. Before the interview he studied coding for the technical portion. "But even I went out of my way to read some of their goals and to say why I wanted to be a part of that, "Isaiah explained over the video call. "I did everything that I should've for the interview." Isaiah thought the interview went well; he followed up on next steps with the hiring manager over several emails over several days. "Till one day she hit me up," explained Isaiah, "and said, 'Hey, we're going through a hiring freeze. All of the managers right now are going through doing a lot of financial planning for this year. And really budgeting this year. If anything changes within the next six months, we'll let you know.' And so that kinda sucked. I was really looking forward to that." Isaiah applied to a digital asset management company who later called him at work and asked for an interview the following day. He had little time to prepare, so again Isaiah used his lunch hour to study coding for the technical portion, but he was sure he didn't study hard enough. They did not call him back for another interview.

These three Black men accepted the promise of coding literacy—that the training they had could be directly applied to a labor market hungry for coder, *Black* coders. They had no aspiration for Google or Facebook—they applied for entry level work, and even that judged their worth as workers as less than qualified compared to others. One reason for this may be the lack of projects that represent conceptualizing business solutions for business ideas. I mention this above with Kevin, but Isaiah extends it further when he reflected on his training in Clearwater Academy and in the internship. "I feel like it would've been more beneficial to have strictly three months, was like, working on just coding. So HTML, CSS, Bootstrap, JavaScript. Those four things, and just relatively work on projects from scratch in there more so than Wordpress," he concluded. "Because like if I were to have my projects … The way I look at it, towards the end I kinda of looking at, if I had that programming experience making my own portfolio from scratch, I probably been able to show businesses I'm applying for I got stuff really ready." The learning to learn

model that Clearwater Academy adopted from Google helped Black adult learners develop problem-solving processes and some critical knowledge of the limits of computation, yet, from Isaiah and Kevin experience on the job market, each felt they had not spent enough time translating those competencies into coding projects. Portfolios of their best work, even if rudimentary in execution, would have proved their ability to take a problem and develop a solution from beginning to end. This knowledge, they suggest, was the missing link for fulfilling their job prospects.

Struggling to Find a Place in the Labor Market with Coding

Without much direction on where else coding could go, Black adult learners re-defined coding literacy's status and gave more value to other literacies and educational institutions. This section shows how coding literacy detached from the job market flounders in the literacy ecology of Black adult learners. DeAndre and Isaiah attempted to keep computer programming alive in their repertoire and looked forward to possibilities of finding other ways of getting into tech later. However, they had a shaky relationship with the nature of coding itself that suggested some hinderance to their fully leveraging its power.

DeAndre took a break from coding after he graduated from Clearwater Academy, because he had needed time to work and get caught up on bills. But, frankly, he welcomed the break from coding. Learning languages in Clearwater Academy was a mental challenge, because DeAndre had to learn multiple languages all at once. "I was … I ain't going to lie to you, when I was doing that, it was hectic. My head hurt. I didn't have enough weed, either," DeAndre explained. I asked him, and other participants, what coding was like to him. His response was influenced by his experiences learning coding in Clearwater Academy as well as his trying to learn post-graduation, but they nevertheless clarified what learning coding looked like in his mind: whenever DeAndre saw code, he would think, "Ah shit," which means "I'm finna prepare for a brain cramp. … Just think about this though: Building a whole website, you use at least 5 to 6 languages. Don't your brain hurt just thinking about that?… Because, remember, you have to put everything in the right spot. Everything has to be in the exact ordering with the exact lettering or it's not going to work. It's a lot of work. It has to be perfect."

Even though coding was a mental challenge, DeAndre still enjoyed it, so much so that he flipped Clearwater Academy's philosophy for learning to code, from practicing all at once to practicing with one computer programming language at a time. He stayed connected with coding via websites like FreeCodeCamp, which offered hundreds of exercises in his list of languages: PHP, SQL, Python, and Swift. He always kept the tab to FreeCodeCamp open on his

browser, so when he opened his laptop, it was the first thing he saw. This tactic was to keep him motivated to learn by seeing he was in the middle of an exercise that needed to be finished, like how some writers leave sentences unfinished to keep them writing and from falling into writer's block. At the time of our interview, DeAndre was about to embark on a new approach to staying connected to coding: just make projects and break things. "I'm finna just start doing a whole bunch of shit—just making random websites that way I can just like learn it more," he said. "Fuck up, fix it, and then find some new shit … You never know."

DeAndre had attempted to turn his devotions to coding literacy into real world opportunities. With the labor market in software development cut off from him, at least for the time being, DeAndre followed Richard's advice to offer freelance work to friends and family. A cousin in Chicago asked DeAndre to develop a custom website to host porn. Months ago, DeAndre learned that freelance was partly about knowing your values and who your work should align with; DeAndre needed practice, so creating an adult website was no problem. However, two months into the project, nothing happened. DeAndre said he just made the shell of the website. "I never put anything up there. … It's just right there. Just sitting there. I just made a basic shell; I haven't put any code into it," DeAndre said. He was waiting for his cousin to send the videos but "they're lazy and they never want to do anything." DeAndre didn't find much value in charging money for a shell of a website; that was easy labor. When he got the videos and started coding the design around them and creating their functionality, then DeAndre would start charging money. Until then, the project sat on his computer unused. DeAndre needed coding literacy to go somewhere tangible, to leap off the training playground and into real projects. But work was scarce in the space outside of the labor market; he didn't seem to leverage what resources he had into opportunities. Yet he still believed in the power of coding. Once he got going with freelance, he would turn that experience into working for a company fulltime. DeAndre said he needed to do research on jobs and what company would be the best fit for him. But that would be a year-long endeavor. His plan was to take the experience from working on the job back into freelance work. Be his own independent worker, making his own money for his family.

I interviewed Isaiah the most consistently every couple of months from early summer to early Fall of 2017, so from interview-to-interview Isaiah's narrative demonstrated the slow digression of his confidence in coding literacy for social mobility. For example, in the second interview, Isaiah had kept his options open to both a tech job and a non-tech job. "Well right now my predicament is, at the end of the day, I would like to be in IT, but if the job I get is not IT, that's what I got to do. Because I got to provide," Isaiah reasoned. "At the end of the day, I just need to get a job. If that job is IT, that's great. If not,

well, oh well. I need a job." A mentor in user experience design at the internship connected him to one job at the local university, and Isaiah had heard of a family member getting a different job at the university that paid seventeen dollars an hour. However, by our third and final interview, failure on the job market and awful experiences at his internship left Isaiah unmotivated and disconnected with the tech industry. Between our second and third interview, he had done a lot of thinking and declared tech wasn't what he wanted to do with his life. "I was rattled because a lot of places didn't want me because I didn't know certain things that I was supposed to gain from [the company] and I didn't," he explained to me. "So I kinda stopped coding for a while. I still know how to code; I still mess with it sometimes but as far as like do I still code? No." He did not lose faith in what coding literacy may do for other Black people: grant them power and a seat at the table of shaping the digital landscape. It was just that he no longer saw himself at that table.

Isaiah started to play to his strengths as a graphic designer and artist, the literacies he started out with before attending Clearwater Academy. He practiced graphic design in high school and later completed one academic year of general education courses at a local community college. His advisors told him he wouldn't start the graphic arts and design program for two or three years; staying in the program for that long didn't make sense to him at first. Isaiah switched from college to the short-term training at Clearwater Academy. Having bathed in the fires of software development, Isaiah wanted to take up college again, but for information technology systems, and then combine coding literacy with graphic design. This was a better, clearer pathway for him. Unlike DeAndre, however, Isaiah had little faith in freelance as a starting option; his experience as an artist informed his perspective on the drawback of independent work, explaining, that "a lot of people that I know aren't willing to pay the amount that really is for a website." It's hard to find anyone willing to pay more than a hundred dollars. "Let's be real," Isaiah continued. "Whatcha going to do? Like I spent this whole time doing this website for me from start to scratch, I mean from start to finish, and all you willing to pay is a hundred dollars? I don't want to be in freelance."

Instead, he would make computer programming work for himself, as an independent small business owner taking care of his newborn son. Isaiah would draw on his passion for fashion and art and then develop a website that would sell his work and showcase designs for a clothing line. While freelance was at the whim of temperamental clients, coding his passion into an ecommerce website and portfolio would allow him to "grow my wealth" and "be able to get a house one day. I want to be able to drive a nice car that doesn't freakin' breakdown. … I mean now that I have a son and I definitely know as this point and time if I'm not seeing results, yeah, I can work on getting to

where I want to be…." I note the difference in tone from discussing the job market as a coder with disdain and disappointment with more hope and determination when Isaiah discussed how he could redirect coding toward his passion. Isaiah's worth may have been denied by powerful tech companies, but he found a clarification on where he could place himself in the economy and, more important, the value he could bring to his family, especially his son. Isaiah imagined himself visiting Japan and owning a car that doesn't breakdown, but his true standard of success was creating a better life for his son through graphic design, art, and computer programming.

Isaiah, Kevin, and DeAndre's experiences on the job market demonstrates the precarious work one must do to "get in." They're narratives about failing to get in or, in the case of Isaiah, staying in software development recalls Clearwater Academy's curriculum. Isaiah, for example, had the hindsight of his internship to realize that perhaps project-based work for three-months would make him more valuable as a Black coder competing for jobs made for white men. At the same time, however, it suggests the standards, by which judgements are made in the job interview; the other documents that described their qualifications did enough to get them an interview, but the coding literacy at a computer code bootcamp had not met their standards. Standards for Black coders from a computer code bootcamp would need to shift. What other assets are at play here that's not clear in the coding literacies they do have? Could separate questions that probe for problem-solving skills, and not just looking at the project itself, become a new direction for assessing their worth? I come back to this question about standards and job candidates' coding literacy assessment in the context of on-the-job experiences from Isaiah, Zelda, and Gerrard. For now, I want to underscore that once coding literacy gets disassociated from the job market, these participants resubscribe computer programming to something for themselves, as independent entrepreneurs, for example. So that's what happens to coding literacy on the job market and what it does for some Black adult learners who attempt to go into that pipeline. However, another place coding literacy goes once disconnected from the job market is a metaphorical closet or safe. Or it's thrown out from a Black adult's life completely.

"I Just Haven't Found a Home for That Skill"

In the section above, I noted that financial and social circumstances shaped Black adult learners' experiences on the job market. For example, Isaiah's expecting his newborn son in September accelerated his effort to get a job after the internship; knowing he had a family to take care of led him to accept that even a non-tech job that pays well would be fine. Those familial and financial

needs shaped how other Black adult learners came to value coding literacy or transform its value in a way that was more realistic and met their needs. In this section, I describe what else happens when coding literacy becomes unmoored from the economy; what readers will discover here is that a prestigious literacy like computer programming that fails to move fast enough and produce results that change the consequences of racism for these Black adult learners become a new resource in their lives as workers and community members. I highlight what happens outside the job market effort, adding another layer to why and, later, how Black adult learners develop in Black tech ecosystems: in these new environments for coding, they assert agency over their literacy development and drive toward other avenues that don't directly benefit software development and its deep ties to our digital ecosystems.

Alice judged that the structures of assessing and welcoming her human capital weren't ideal. While she could probably get a paid three to six-month internship immediately, companies made no promises that they would promote her to full-time permanent employment. She could have applied for a different job, leverage the internship into full time work elsewhere, but Alice had no interest in staying on the job market path for nearly a year. She had two daughters and a husband to financially support; Alice needed stable, long-term work that offered no surprises but only consistency. After graduating from Clearwater Academy, she did two things: first, a nice vacation with her family; second, a return to banking where Alice had spent much of her professional career. Clearwater Academy's contribution was getting Alice access to touring the same company Isaiah would later intern for. After graduation, Alice connected with a high school friend who happened to work as a hiring manager for the financial company, and she helped Alice get an interview via referral. Although Alice did not go into software development, she did discover that knowing some computer programming gave her an advantage in the interview process. Alice mentioned that she knew JavaScript, and that put her ahead of every other applicant. "And she [the hiring manager] was like, 'Wait what did you just say? JavaScript? You know JavaScript?'" Alice explained. "And I was like, 'Yeah.' And she was like, 'Oh well some of our forms, we have to use JavaScript and someone who knows that would be helpful.' And I was like, 'Well, yeah'—You know, I keep up with—I do Code Academy every now and then. Keep up. But yeah, I was like, 'I know that.' And so she was like, 'Oh.' So that was like a turning point in the interview. Like it was going well already. I could tell but then it was kinda like, you know, she stopped. 'Wait.'" That was the most Clearwater Academy and coding literacy added to Alice's worth.

Recall that Kevin had tried and failed to make any moves on software development and ended up returning to cooking. His managers could tell how

unhappy Kevin was, so they suggested he quit and figure out what pathways would fulfill him. After Kevin found a replacement cook, he hung out with friends, took time to reflect, and slowly felt reconnected with himself. Kevin ended up landing a job repairing hardware for a major computing retail store. Like Alice, knowing computer programming launched him ahead of other job candidates. During the interview he brought up Clearwater Academy. "I was telling them about the coding, and they were like, 'Cool.'"

Both Kevin and Alice admitted that although computer programming helped them get hired in jobs adjacent to coding, they themselves found little reason to use their knowledge. Kevin said that "maybe in a month I write, like, twenty lines of code. I'm like, '"Maybe this can fix it."' 'Oh, yeah, cool!'" Otherwise, he spent his working hours fixing hardware and software, never digging into the ghost beneath the machine. When I returned for another interview with Alice three months later, the story was still the same. Although management told her that the company used JavaScript to design documents, Alice herself never had to code. Instead, her main responsibility was taking requests for custom financial documents from U.S. credit unions, such as credit card applications, mortgage loan applications, membership registration, opening a checking and savings account, and credit card applications. Her company designed these documents and maintained their compliance. Alice was one of the first steps in the process of creating these financial documents: She took requests from clients via phone or email. That involved identifying the type of document they wanted and how it should be customized to their company brand and policy. "And then you send it over to compliance analysts and consultants who like review the language, the department that has to be in there to be complaint, yadda, yadda," Alice explained to me, "and then they would send it to a document specialist who would actually create the document, add the logo, send it out via paper or electronic format." Alice and Kevin then found themselves adjacent to coding, sitting beside coding, but never in a position to shape digital technologies, or the design of documents, in the ways others do. This meant they were removed from the more prestigious areas of the knowledge economy. Better positioned socially but not at the table of technology design. Still coding literacy echoes or reverberates to help them obtain some level of social mobility.

Coding literacy sometimes went unused or was locked up. This isn't a metaphor. Quite literally the resources Clearwater Academy provided sat on a computer unused. Rosie found Clearwater Academy's resources for entrepreneurship the most valuable for her life. However, after she graduated, Rosie returned to the family duties she had been doing before attending the computer code bootcamp: taking care of her mom and her brother who had stage four cancer. Each day or week could look different. "So I might need to call to

make appointments for my mom," Rosie explained. "Take her to appointments or to the store. Just caregiving in general. You just don't know what today is going to bring." She also had to make sure her schedule would be clear for her brother. For example, once he had scheduled a last-minute procedure and needed someone to drive him home. "It's just like, 'Okay, I didn't have anything specifically at that time, so I can do it.' But you just don't know what's gonna come at you in the course of a day," Rosie explained. Because Rosie spent most days caregiving for her family, she "haven't had the opportunity to utilize those skills yet." She said the same thing again nearly a year after starting the computer code bootcamp: "I haven't had the opportunity to open up that door yet." Rosie knew where to go in the event she did have an opportunity to open that door, explaining to me, "Well I do know where the resources are so in the future when I get here in my vault. So I do know the websites and I took a lot of notes that I keep hold of." Rosie used her experience to write content for a lupus support group's website, but coding sat in a vault waiting to be used.

Kevin loved his new job in IT, but not finding a whole lot of use for coding literacy, he also put computer programming away. The problem was that he couldn't imagine how else it could be used, something not really explored at Clearwater Academy, which was hyper-focused on coding literacy for work. He put the problem to me like this: "Yeah, I just haven't found a home for that skill. I would like to do something with it. I just haven't found a home for that skill yet." Kevin knew he could find jobs—he knew that experience well. He could investigate Meetups around town, too. So he understood coding could go into many places. But what made the most sense for him, where he was in life, was a puzzle to work on. "But the thing is," said Kevin, "when I think about coding it's just like, 'What do I want to do with this?' I just really haven't found a place for it. You know, like my other skills, I have a place for them. I'm like, 'Okay, I can do this. I can do this with this skill.'" Kevin shows that computer programming is one of many literacy practices he possesses; some literacies have clear locations for their uses, but computer programming still lingers in the air, or sits on his computer, waiting to be used. By the time I interviewed him, Kevin was getting back into coding, revisiting some of the lessons he had completed back at Clearwater Academy. Perhaps through practice he could discover where coding could go.

This section covered two narratives: what happens when coding literacy practices are fixed to the job market, as Clearwater Academy intended, and what happens when coding literacy breaks away from that purpose. A mixed story becomes clear on how structures for work still create barriers for participants, sometimes getting in the way of coding being a response to the consequences of racism. Still, coding literacy lingers like a specter, a resource to leverage into other kinds of work. In the final subsection on coding literacy

decay and the ways it happens, I turn attention to the joy of having not doing coding at all. On this note, Black adult learners pivot to other literacies and institutions for social mobility.

"Definitely Not What I Want to Do as My Career"

Although framed as necessary to the economy and for social mobility, arguments appealing to anyone who loves tech and needs money, Black adult learners had not bought into the idea after graduation. In some ways, Black adult learners were happy to *not* be coding at all, finding the practice more trouble than it was worth. Alice, for example, knew a few weeks into Clearwater Academy that she didn't like computer programming. I wanted to unpack further this fissure, how Alice had joy for learning tech but not at the level of coding. She explained that coding was like "building a Lego. Lots of tiny different pieces. You kinda trial and error to see if they're gonna fit. Um, you know, there's lots of different ways to do things. like you're building a pirate ship and it has ten thousand pieces and really hard instructions and they're not really good instructions, so it's kinda, you know, random little pictures and it doesn't have any words. …" Alice couldn't quite pinpoint why she didn't want to code. She could manage coding just fine, although it was still a struggle to do in Clearwater Academy, and Alice wasn't sure if struggling with the specifics of coding turned her away from software development as a career. What Alic did know for sure was that when she practiced coding it was "definitely not what I want to do as my career. That part of, you know, learning computers just didn't interest me as much."

She did find design appealing. In fact, Alice tried to transform the design skills she learned in Clearwater Academy into work; she found one job, but the pay was abysmal and the benefits subpar. Another adjacent area of interest to coding was IT; for that, she was already in the process of doing by attending a local community college and majoring in Information Systems. Navigating college while working full time with a family of four was not easy, as she constantly struggled for time to study. For example, she had to retake writing classes because they didn't transfer from her participation in Journey, the humanities course for returning adults offered through the local university. "I'm taking one this semester," explained Alice, "and it's a lot of work. I mean the readings usually take like three hours alone. It's just—I have to dedicate a lot of time, and I struggle with…Time is something I do not have a lot of." Her trying to find time to study was reminiscent of Clearwater Academy, where she had to find time to study after putting her children to bed. She visited libraries to complete work, and even briefly checked out books that were too expensive to buy and didn't pay much if she had tried to sell them back.

Nevertheless, the payoff was there: In fall 2017, she finished with a 4.0 GPA, and the hardware class was her favorite. Other courses offered clear career pathways in help desk and information systems. She attended a fair where instructors representing each area of the IT program set up tables. "And I actually talked to them to try to narrow down what exactly—and that's what I came up with. Because I was gonna do like network security, but they said that one was super specific," said Alice. One of the instructors said that network security was more challenging than IT help desk, "so I was like 'Eh I wanna stay broad because I can do a lot of things.'" Sitting down to code wasn't super interesting to her but in IT Alice could combine her love for people with technology. Computer programming can have impacts not immediately felt or seen but with IT she could connect with people directly and note the influence right then and there.

It's clear now that Alice had gone completely away from coding for career. Like leveraging coding to get a non-coding job in banking, Alice was actively ideating other ways she could launch herself into IT. She had eyed that department in her current job from touring the company in spring 2017 and ever since had been plotting how to spring out of her current position. In other words, during our interview Alice frequently imagined how she could use every ounce of her literacy in document requests as leverage into IT. From what little she knew of JavaScript to the CompTIA A+ certification to taking apart CPUs and error handling, she could learn while studying for her associates degree. Alice was prepared to make moves, and she wasn't going to hide that desire from management: "So the goal is, I am gonna talk to my manager eventually, but I wanna kind of talk to her about the degree path I'm taking, working, tuition reimbursement conversations. And then let her also kinda know that I would like to make a strategic transition to IT at some point. So that's kind of—this is kinda my foot in the door kind of position." She thought the combination of literacies—not coding literacy alone—produced value in the economy and would, she hoped, lead to not only social mobility, but the benefits that sometimes come with that upward move in class: flexible work from home so Alice could be more present for her two daughters.

Zelda graduated from the Fall 2017 class. A self-proclaimed nerd and mother of one daughter, Zelda was the only participant other than Isaiah to get an internship. For our first interview, we met in a diner downtown. Her daughter—about one and half years old—nursed a foam egg as we chatted over lunch. During the internship, Zelda was actively trying to learn new programming languages, something that was fun like Python, Ruby, or Swift. She found it boring, so the search for a programming language that was fun was her only way to stay in software development. Her status as a web developer intern even attracted software developer men on dating apps. Zelda possessed "geek capital,"

which drew in social resources that could help her get ahead in the industry (Twine, 2022). For example, an Indian coder reached out on one of the apps, and after getting to know Zelda, was thoroughly impressed that a Black woman was in a coding position. He offered himself as a resource for learning the computer programming language Ruby; Zelda hated him, but she found men like him useful for upskilling and networking. She used other men she met online to learn more about their jobs: "What do they do? 'Oh! I want to have that job! Tell me more.'" Zelda was less interested in dating and more interested in how those men could help her get ahead in software development. Even in the first interview, at the start of her internship, Zelda really found data analytics at her the internship more interesting. At the diner, Zelda tried to keep her daughter on track with eating her food. She said bluntly, "It's just kind of boring to me. I mean I can read it. I don't like coding; I don't like code. I don't want to be a coder, unless I can learn a language that I like." She loved doing data analytics for the company because she loved numbers. Working with numbers in an Excel sheet was "relaxing; it's calming. It's like smoking weed … Making sure all of them are equal; I say doing finance because I appreciate numbers that have meaning behind them. I mean in front of them. I mean, it depends on which currency." That was in spring 2018. Later in July 2018, I met Zelda again, this time in a park by a lake. Her daughter wanted to chase after ducks waddling near the shore; little cousins played on the jungle gym nearby. As we caught up about how her internship concluded, Zelda had not found a fun programming language worth learning, so she had traded it for something in data analytics and a new area of interest: design. "I like designing," Zelda told me. "Like that was the thing I fell in love with at my job. Like I guess I could give credit to. Is that I found my niche." Finding her niche: it's one of many experiences with coding literacy—its processes and social structures—that teach Black adult learners where they fit in the world, to clarify what niche or literacies give value to Black well-being and sense of self, eliding the white software world and its dire need for diverse perspectives on technology design.

What I've described in the first half of this chapter are the multiple ways coding literacy decays; that is, the relationship Black adult learners have with computer programming when on the job market has conflict and pressure. These locations of judgement extend or retract their literacy development. Through direct experience with coding, Black adult learners can rethink or revise their position in the economy and what they truly want. They deny coding literacy's power because coding literacy has less value than they had thought; they give power to other literacies, other institutions, many of them educational or legacies with proven results. A re-assessment of their ecology of literacies ensues and they find a way to push further, to upskill, to easily flow in the economy.

Agreeing to Participate in Disruptive Whiteness

I have traced the variety of contours coding literacy takes when disconnected from the job market. How does labor, race, and coding literacy converge to help one achieve the purpose of learning computer programming—an internship? In this section, I detail the internship experiences of three Black adult learners, the only three who got an internship in my study. One participant—Gerrard—had graduated two years before my study and was the only one who made a career of their training. He was a full stack developer working for an insurance company at the time of our interview. While some readers note the quantitative data of success (or failure) to get a job, I'm more focused on the narratives that detail the conditions of their work, what those narratives bring to light that can help me think about coding literacy in relationship to labor and race, and what that relationship may indicate about emerging technologies in the work lives of Black adult learners. Plus, coding adjacent jobs complicates what counts as a desired outcome from a computer code bootcamp's training. Whiteness can disrupt Black people's literacy practices in the workplace; while they focus on doing good work, their colleagues note their race and supposedly limited knowledge of coding due to their status as graduates from computer code bootcamps. I start with the rhetorical value of internships for Clearwater Academy and tech companies in general. With this context, I highlight incidents from the internship experiences of Isaiah, Zelda, and Gerrard.

Internships are the bread and butter of Clearwater Academy marketing. To be placed in an internship, adult learners must complete all coursework requirements over the fourteen weeks of intensive training in computer programming and employability skills for graduation, pass a drug test, and show they can behave professionally in timeliness, email etiquette, and business attire. Graduates must still interview for the position, and they only get one chance, as DeAndre in the previous section experienced; if they fail to impress, that's it. No other opportunities to do an internship. Clearwater Academy graduates could be placed among several companies in tech or in a software development department within a company. Internships through Clearwater Academy were often paid full time work for three to six months (sometimes companies would check in with interns at three months and decide to extend their time to a full six months). They did not have the benefits typically afforded to permanent employees, like health insurance or a 401(k). According to Clearwater Academy's policies, internships reinforce the skills learned in the bootcamp. But there's an economic goal: if Black adult learners do well enough, they'll get hired on permanently or the internship supervisor at the company may write a strong letter of recommendation for future job searches.

Internships may be mutually beneficial to the reputations of the computer code bootcamp and the tech company. The adult learner contributes to real-world work in the company, often at a moment in the development process where their mistakes won't hurt the product overall, but they also become a witness to the strength of their training in college and a witness to the company's great work culture. For Clearwater Academy, the success of a candidate strengthens ties between the bootcamp and potential tech sponsors and employers. At the time of my study, Clearwater Academy was just rebuilding its reputation in the community. The first few classes of graduates worked poorly on the job, and as a result, Clearwater lost multiple relationships with tech companies. Thanks to Richard and Jessica's curriculum, however, the bootcamp had solidified itself in the world of tech again. An internship means to benefit all parties. Internships in software development place Black people close to power and status; by showing their worth to tech companies, they can receive in return social connections and material resources necessary to obtain social mobility. This process – coding literacy to advance human capital, laboring in a company to gain resources and then a well-paying job – makes up the pipeline for diversifying the tech industry.

An internship may reinforce what's learned in the bootcamp but what exactly it reinforces remains uncertain. As Richard explained to the spring 2017 class, these are internships made for white men; the whiteness of tech hold the pipeline together and even flows through the pipe itself. Black interns must swim in that whiteness to be successful. Black adult learners must *perform* according to the expectations of the workplace. And they have been prepared to follow proper professional email etiquette, professional attire, and timeliness is to code the experience of work as a white middle-class experience. In other words, the tech company as sponsor of participants' coding literacy have little reason to interrogate their expectations and cultures more closely and are even less certain of how to adapt to Black adult learners with computer code bootcamp experience. I submit that coding literacy gets reinforced in the context of race and racism, and whiteness as a reinforced tool inside the internship disrupts the power of coding literacy to enact real change for Black lives. I document race's complexity in Isaiah, Zelda, and Gerrard's internship experiences and show how the overemphasis on whiteness as a marker of success hides the assets they bring to technology design. Their tech companies had several missed opportunities to learn from these Black adult learners. In the grander scheme of this chapter's argument, the three participants' stories demonstrate how they are squeezed between the consequences of racism in the world and the consequences of racism within the companies meant to help them. This section underscores how coding literacy works at best as echoes in Black lives, but not the music they dance to.

Taken together, the three participants with internships cover a variety of contexts, from small startups to nationally known financial companies. Gerrard graduated in 2015 and completed an internship with a startup company that created custom software for other businesses; his primary focus was backend programming. Isaiah graduated in spring 2017 and did a 6-month internship with the same company Alice would later work for. Like Gerrard, Isaiah worked with a team of backend programmers. Finally, Zelda graduated in fall 2017 and was hired on to complete a 6-month internship with a mid-sized company that developed software platforms for clinical researchers. Although varying in size and service, each team of developers and managers participants worked for brought whiteness to their relationship and vice versa. I document how whiteness disrupts the coding literacy practices Black adult learners attempted to learn.

Gerrard

Isaiah, Zelda, and Gerrard worked in majority white tech companies, as expected given the city they lived in and how racism pushed resources for computer programming to white men. However, they weren't prepared for the immense pressure of being a Black coder in these workplaces. That feeling disrupted coding practices left and right for participants. Gerrard was already a full stack developer when we spoke at a coffee shop downtown. The journey to that valuable and prestigious status was not easy when he first started out as an intern. In Clearwater Academy, Gerrard enjoyed pair programming alongside a diverse group of adult learners. He recalled that those early days of the computer code bootcamp "felt a little more, I guess, like, I didn't feel like I was out of my bubble, so to speak. … But Clearwater—it's just great because so many folks of color just trying to learn how to code. Helping each other out. I think it was a great atmosphere. A great learning atmosphere." He had no trouble asking for help from peers or his instructors; he had no trouble learning coding literacy.

But the mental weight of working in an all-white internship left him bereft and closed off from his co-workers. Stereotype threat settled into his mind immediately during the first three months of the internship. Coined by psychologists Claude Steele and Joshua Aronson, Black people, and other identity groups, experience stereotype threat when they fear "confirming, as a self-characteristic, a negative stereotype about one's group" (Steele & Aronson, 1995, p. 797). Steele and Aronson's research focused on schooling and tests, but here was stereotype threat in the meritocracy of coding. The mental distress can arise in multiple ways, but for Gerrard, possessing "solo status" in the workplace shaped how he would interact with others (Sekaquaptewa

& Thompson, 2003, p. 73). When he worked at the small startup, Gerrard felt his coding had to be perfect, or he would just attract his white co-workers' suspicions. "Because of the whole stigma of being Black," Gerrard explained to me, "and you had to work two times better, you know what I mean? And that's not always true. Not everyone's great. I was trying to fit that narrative, you know. I was trying to fit those shoes." Asking questions, Gerrard thought, confirmed the negative stereotype that Black people are lazy and aren't smart was in asking questions. While asking questions helped him succeed in Clearwater, questions in a real-world job only revealed how much he didn't know and how much of a mistake the white tech world made allowing a Black man to walk their lands. Having solo status only heightened that negative stereotype; he represented Black people, and he needed to show they were good coders. Gerrard thought too much about race and racism, and thus felt more outside of himself, like "a piece of me was out there in the ether. Gone. Trying to get it back. Try to reel it back in." Self-doubt as a Black coder followed him for months.

To be fair, Gerrard's co-workers and managers did nothing to activate this negative stereotype; they merely existed doing their day-to-day work. Gerrard explained they could tell he behaved as if he was "tiptoeing around [them] every day. I didn't want to come off like [that] because in my head I'm always thinking about stereotypes and things like that. And I don't want to come off as this Black dude." These white workers had no idea how to mitigate the problem of whiteness and stereotype threat; their only solution, it seemed, was leaving Gerrard to figure out how to work through these negative feelings. His coding was on par; in fact, the internship sent him to another computer code bootcamp so he could learn how algorithms supported backend programming. Gerrard had to convince himself to stop caring what others thought about his being a Black coder: Gerrard redirected his energy into achieving his personal goals, to say to himself that racism was, and here I cite the words of Toni Morrison, a disease white people had to figure out.

A long road trip to a conference in Texas was also helpful: it was just Gerrard and his team in a car, so he had no choice but to get to know them. But the scenario confirms existing research on how to counteract stereotype threat: persisting to participate in a group to eventually be seen (Cohen & Steele, 2002), which Gerrard's co-workers honestly wanted. Gerrard had many wins after his three-month ordeal with stereotype threat. For example, the startup later hired Gerrard full-time at the end of his six-month internship. He said he found himself doing more design work for the company during "Christmas time." In 2017, *Star Wars: The Force Awakens* was in theatres. Taking inspiration from Chewbacca, Gerrard redesigned the company mascot with

a Wookie hat and bandolier. The managers loved his idea and printed the custom design on their holiday cards, which attracted the attention of conference organizers down in Florida. They tapped Gerrard to design a one-page conference program. That job attracted another conference; this one was local and focused on inviting software developers who were experts in a specific computer programming language. Gerrard designed and coded their website with another Clearwater Academy alumni. Gerrard had made such inroads with his work that he even did a keynote at that same conference. He would later depart from the small startup to work frontend design for a major insurance company; that workplace had an extensive plan for inclusive practices, had hired diverse coders and other staff, and even had a record of hiring some Clearwater Academy graduates. Transformation within the company even before Gerrard arrived on the scene made that work environment more comfortable and responsive to his race and expertise in computer programming.

Gerrard's experience with stereotype threat made him think about the mental health of other Black coders. While he had a terrible time breaking through the mental and emotional strain of whiteness in the small startup, he admitted that Black coders have worse experience in California. I joked that since he was a full stack developer, Gerrard could try for Silicon Valley. He worried, however, that Black people were leaving tech fast and programs like Clearwater Academy helped plug in leaks along the tech pipeline. While Gerrard appreciated any diversity and inclusion effort from tech companies, he mused, "if you aren't really investing in mental health of these Black and Brown developers, you really have a problem." Gerrard recalled the suicide of thirty-one-year-old Joseph Thomas, a software developer who had worked in Uber's notoriously known workplace culture. During his five-month employment for the ride share company, Thomas worked long hours and slowly his personality began to change. Working under the intense strain of Uber, Thomas later died by suicide. The family sued Uber for contributing to Thomas' death, but the company claimed he had not worked for them long enough to claim benefits for psychiatric injuries under California law (Morse, 2017). "He was just extremely pressured," Gerrard said as he recounted the story. "He felt marginalized. And just … I can only imagine. If he was feeling what I was feeling it must've been that times 1000. And he had two sons, a wife, all that. And I don't want that to happen." So crucial was mental health to the productivity of Black coders, Gerrard suggested that the company and Black coders invest in therapy to make it through. Although the suggestion made sense, I could not help but think that perhaps therapy, even if as an add-on to health benefits from a tech company, was more of a Band-Aid than a treatment for whiteness. I'm not necessarily making a critique of Gerrard's suggestions but rather nodding toward Sara Ahmed's (2012) observation about diversity and

inclusion practices in universities: administration invests in DEI not to address whiteness but so that no one *finds* whiteness, so that it is no longer visible. Providing therapy puts the onus of addressing whiteness in tech on Black coders. It's an additional burden on marginalized coders, occupying their cognitive capacity to think about themselves and coding literacy at the same time. Whiteness stays intact.

Gerrard focused on the realities of working in white tech companies. Although therapy would be a worthy investment for Black coders and their employers, he knew from his early struggles in the internship that he needed to carve out a space for himself and other Black people. "I was like, 'Man, when you're older you have to create your own stuff,'" Gerrard recalled during our interview together. While he enjoyed his status as a full stack developer, he knew real control over tech was in venture capital. He would leverage his position and financial status to fund other Black-owned tech companies, to invest in properties that those Black techies could use for themselves, separate from the expectations of whiteness. Living the dream DeAndre imagined for himself, Gerrard hoped he would not work for someone else in five years: "Right now I'm just learning the tricks of the trade. Understanding the business and just teaching myself as I go along. And I want to bring other folks of color in as well." Just as he learned about the toil of whiteness on Black coders' health through his and others' experiences, Gerrard noticed how Silicon Valley was also a detriment to the local housing market; he again dreamed of an alternative that moved away from the Silicon Valley-model of business toward the growing tech market in Africa. That's where the safe space for Black coders was. In the future, Gerrard wanted to visit to learn where could contribute and invest. Ultimately, Gerrard argued, tech should be used to better communities: "You can't make an app for everything," he reasoned. "You can't. You can't. Invest in community. Invest in the materials. Work with the environment instead of against it."

Despite the very rough start to his internship, Gerrard broke through whiteness and broke into the tech industry. Navigating the whiteness of tech put a significant toll on his coding literacy practice and even put at risk his value as a literate worker. And yet looking within himself and his goals and caring less and less about the needs of whiteness, helped Gerrard re-discover his worth to himself and to his employers. But his coding literacy experience and the business structures working in and around it clarified his next ambitious goal: to take tech culture's emphasis on independence and self-sufficiency and turn it into a vision for Black coding literacy practices; those practices include gathering the expertise of Black people into one space, investing Black dollars into Black talent and tech, and create a Black tech ecosystem that promoted affordable housing and environmental justice.

Isaiah

Isaiah learned he would have a baby in February 2017, just a few days before he started attending Clearwater Academy. His successful interview for an internship with a financial services company—one of the largest in the country—in May 2017 was a godsend. With his foot in the door of tech, Isaiah could build on his frontend design experience by learning backend programming, and, maybe, do well enough to get a permanent position or a different full-time job somewhere else. Such was Clearwater Academy's goal, although it was never promised or guaranteed. Isaiah had gone to high school with Gerrard; he was following in his footsteps from two years behind. However, unlike Gerrard, whiteness disrupted Isaiah's coding literacy from beginning to end. He enjoyed working with his software development team; he was the only Black intern out of seventy-two in the program. Isaiah remembered that there were about six Asian or Asian American undergraduates with the others being white. Yet he enjoyed their company and attending events with them. Isaiah even made friends with one undergraduate. They arranged to meet each day for lunch and started a little rivalry over the best Starburst flavor: cherry or orange. "We essentially clicked," Isaiah explained to me during our third and final interview, "and started scheduling things after that with each other. And it was just really dope how that just happened. And so like I said [the company] would be fine if not for that." Isaiah referred to his squabbles with management, specifically his assigned peer mentor, Sarah, and the peer mentor's product manager, Tonya. These two represented whiteness' tight grip on coding literacy practices in the company.

During his job interview, Isaiah acknowledged that he knew little about backend programming, but he was motivated to learn its languages and become a full stack developer. Isaiah's worth as human capital was learning on the job and learning quickly. He remembered exactly what they told him in response: "This is what they told me: 'You will be learning backend programming. You will be getting training in backend.'" Tonya assigned Sarah to mentor Isaiah, to teach him the programming language C# (pronounced "C-sharp) while he completed small projects for the company. The first two weeks went well: Sarah extended Isaiah's coding literacy practices through one-on-one meetings to discuss C#, instances, and barrier methods (lines of code that instruct a software program to not execute a result until other lines of executed code meet a specific criterion, or "the barrier"). She was also responsive to Isaiah when he was confused. For example, variables and objects threw him off because they seemed similar to each other. What made them distinct? She gave him reliable videos and articles to view and read from home, and then the next day Isaiah met with Sarah to dissect a specific concept from

the materials that he didn't understand. Some tutorial videos were harder to follow because Isaiah had not set up his integrated development environment (programs in which you can write and execute lines of code) on his computer. So he couldn't write the same code from the video. "She would explain it to me," Isaiah said. "I would get it. She would be like, 'You get it?' I was like, 'Yeah.' So I was picking up on it right now. Cool." After those two weeks, the peer mentorship stopped. Sarah had a family emergency out in another state and was gone for a week. Left without a mentor, Isaiah tried to keep his coding literacy going by learning C# on his own while completing smaller projects in frontend design. But the language was too hard, and the only other person he could turn to for help was a senior developer with a tight schedule.

Something changed when Sarah returned the following week: she scheduled one-on-one meetings less frequently, and Isaiah later learned from another intern that Sarah was meeting him instead of Isaiah. Her time and labor switched from a Black computer code bootcamp graduate to a white undergraduate from a prestigious computer science program. What she thought about Isaiah's coding literacy practices became known when Tonya, the program manager, requested to see him for a meeting: "Yeah your skills aren't up to par," Tonya had explained to Isaiah. He recalled that she thought he "wasn't articulate enough as the other interns. And things like that. And what frustrated me about that was that she based that on what my peer mentor said." The racial microaggression on his intelligence was a slap in the face and unfair. Suddenly Isaiah found himself being judged according to the standards set for the other white interns, undergraduates who had cut their teeth on learning multiple programming languages at the same time and steeped in computer science theory. The critique had multiple layers: not only did Isaiah not know backend programming, but it also didn't seem like he was working hard enough, that he didn't go home and study.

Isaiah had significant reasons to pushback against these ideas. First, he yearned to learn and ask questions about computer programming from professional experts. Eventually, Sarah did invite Isaiah to join meetings with the other intern. The topic was objects and classes in C#. But this invitation wasn't to help him strengthen his coding literacy, as had been the case before the family emergency. The meeting itself was a microaggression. From the moment the meeting began, Sarah said, "Look, I was actually skeptical of inviting you to our meeting because I didn't think you'd understand anything relative to the subject. I don't know if I can dumb it down anymore for you." Isaiah pushed back: he wasn't stupid. He could learn computer programming without "dumbing down" the teaching. Isaiah just needed his mentor to strategically teach the concepts in a way he could understand. Sarah, he thought, needed to find a different standard of assessment and instructional method

that would match the experiences of a computer code bootcamp graduate, not a senior college student. Case in point: the intern later helped Isaiah understand C# better than Sarah. Second, studying at home was an ongoing domestic problem for Isaiah. His work ethic outside of the office and the consequences of his hard work ethic was like poetry to my ears. His words are worth quoting at length:

> It's getting to the point, Antonio, where me and my girl have arguments. Huge arguments. Because I come home. I code. I wake up. Go to work. I code. I go home. I code. I code until I'm ready to go to sleep. And they tell me I don't go home and study? I don't go home and practice? That's not fair. You can't tell me that unless you hack my computer and watch me at night. You have no right to tell me that. None.

Tonya layered on one more racial microaggression: "She told me I wasn't articulate enough as the other interns … I don't know. I didn't like that. I want to pull the race card but that borderline racist, for you to tell me that I'm not articulate enough and predominantly most of the interns are white. …" Isaiah had learned the unfortunate assets of code switching as a necessary move in all-white space in high school. He admitted that he came from a "background of thugs"—Black low-income communities raised in disinvested neighborhoods—and it was Gerrard who helped Isaiah realize that background was an affront to white people. While Gerrard picked apart Isaiah's language, he learned from another mutual friend and a mentor how to speak and show himself "business ready." From sophomore year into junior year, Isaiah taught himself how to code-switch. That was, again, an unfortunate necessary skill for community college where he was often in majority white spaces with classmates and professors. "I had to speak formally," said Isaiah. "There was no, 'Yeah aright, I got that. Aight, you can catch me on the flip.' There was none of that; it was like, 'Yeah I'm going to go speak to Gregory because we have to talk about how we can implement this project or how we can set up the gallery.' I switched up quick. Where I could've been 'Aight, I got ta speak to Greg real quick. We need to get this project on the go.' Difference in the way I say things. And they tell me I don't speak articulate." Isaiah was honest about his shortcomings, from not knowing computer programming to making sure he communicated clearly. Sometimes he would catch himself when talking to team members, other interns, or managers. He took responsibility for what they considered his flaws. It was management who did not do the same. Despite these experiences and efforts to code switch, Isaiah felt the weight of stereotype threat on his mental health and emotional well-being; he had become too self-conscious of his language around management: "I'm

that much more conscious. And then every time I speak, I either stumble on my words or stutter." If he messed up talking during a meeting with the two people who had said he wasn't articulate, Isaiah would have to run a formula on the consequences in his head: "She can or she won't, or she will or she won't hold that against you. What are you doing? Are you going to be fluent or are you going to stumble?" Whiteness was getting in the way of his coding literacy (articulating his knowledge of computer programming and asking the right questions) and relationships with more powerful people. His rhetorical performance as a Black body worthy of the rewards given for his labor faltered during the internship. Coding literacy was constrained.

What about support against these racial microaggressions? While some co-workers, including a senior user experience and interface designer, agreed that racism was in play, Isaiah needed help from Clearwater Academy. The computer code bootcamp's internship policy states that if there are issues, a coordinator from Clearwater Academy could mediate. Isaiah didn't trust the policy, however. He ran calculations in his head, considered all the factors that would make everyone point to him as the problem. First, he was an intern; he could make a case to management about his peer mentor refusing to teach him, especially when they had promised that Isaiah would learn backend programming. But that was a full-time employee versus an intern. Who had real power? Perhaps to the coding literate who had proven themselves as worthy contributor to the labor of the financial tech sector. The one with mountains of experience teaching other interns. Second, Isaiah felt that the balance of power wasn't tipped in his favor. He worried that the professional ties between Clearwater Academy and the tech sponsor would diminish his own reputation. Jessica, the employability skills instructor, who would be the mediator between Isaiah and the internship program, had a favorable professional relationship with Tonya. She admired the product manager, and apparently previous intern experiences went well. "If I go talk to Jessica about Tonya, and some of the things she's doing wrong, she's gonna be like, 'Well what are you going to do to improve?' Like I mean I'm trying to tell you I haven't even got the chance to prove that because they're not even trying to give me that."

As the summer waned into July, Isaiah was getting closer to September, the month of his son's expected birth. He wanted to know if he would receive another three months on the internship, so that way Isaiah could start looking for a new job. The peer mentor created new conditions that contradicted the requirements established by management. For example, dressing in proper attire and creating projects using JavaScript from scratch. Although the company used JQuery—a library of pre-made JavaScript code that makes coding faster and more efficient—the manager insisted Isaiah use JavaScript, and then submit the project by mid-July. At the time he received the assignment,

that would be due in just two weeks. Moreover, Sarah did not give more instructions beyond "Impress me." Isaiah was frustrated. First, he had to complete some kind of project without clear guidelines and then do so while completing work that mattered to the company. He appreciated the opportunity to show his ability to develop a solution and execute the solution through computer programming, but the request felt unreasonable and undoable within the timeline given. Management told Isaiah to not follow these requirements from his mentor, but the damage done from the peer mentor remained: Isaiah had not been given a fair chance to show how his skills and competencies as a coder made him valuable human capital to the labor of the company, and the digital ecosystem itself. Human resources requested that Isaiah leave the internship two weeks early and receive his pay for those two weeks. They said he didn't know enough backend programming and that perhaps there was a miscommunication in department's expectations three months before. Isaiah politely made it known that the expectation was clear: he would be learning backend programming. They had failed him. Exhausted by the internship, Isaiah took the request and returned to his newborn son.

Both racial microaggressions—that he didn't work hard enough, and he didn't talk about coding, or talk in general, like white interns—showed that Isaiah's willingness to learn backend programming wasn't an asset; it was a burden and a liability. But it wasn't computer programming itself; it was that he also didn't embody the behaviors, practices, and language of whiteness that seemed to be a prerequisite for workplace culture and collaboration. The assets he brought with him—code switching and an intense work ethic that even upset his partner—were hidden underneath expectations that perhaps didn't match with computer code bootcamp graduates or at least were too rigid to adapt to Isaiah's specific background: a Black coder with no backend programming knowledge. This internship experience—using coding in the context it was meant to be used—helped him consider new opportunities with other kinds of literacy practices for himself.

Zelda

Stereotype threat in all-white spaces suggest the high cost of performing whiteness or not in the internship. However, whiteness hovers like a specter even if you do not feel the burden of stereotype threat in a tech workplace. Zelda discussed her work as a web developer and data analyst in the marketing department with confidence and poise. She joined a company that provided management systems for clinical software in January 2018 as a five-month intern and then got an extension to stay through August. We were chatting at a lake in a park at the end of her internship, watching her two-year old daughter

try to play with ducks. We had last spoken in March before then. Remembering Isaiah's harrowing tale from last year, I asked Zelda why she got an extension. Zelda responded with amusement: "You know my deadlines? I'm a cool person? People fucking like me?" Yes, she had met her deadlines, she had done the work the company wanted her to do to meet their standards. Her immediate supervisor also pulled for Zelda's extension, when the company wanted to end the internship because the supervisor was due to have a baby soon.

Unlike Gerrard and Isaiah, Zelda felt no stereotype threat. She did feel out of place, less so because she was the only Black woman in the small startup and more because Zelda had a hard time connecting with people who mostly lived privileged and safe lives. Most co-workers were young and had college degrees, but they didn't make mistakes or do stupid illegal things. Only her manager made what Zelda considered a mistake: having a baby at fifteen. Zelda herself gave birth to her daughter as an adult, but she could still relate to her manager. Both had "fucked up" at some point in life. That's the reality of life, and for Zelda that meant her manager had cultural and social capital. She knew what was up. However, Zelda carried a different kind of capital: proximity to whiteness. She was visibly Black, but her daughter was visibly white. Just having a picture of her daughter on her desk would change Zelda's white co-workers' disposition. "I don't know," said Zelda. "I put a picture up and when people see it, like, 'Oh my God, is that your daughter? So cute!' And then they start talking to me. More often than they were." When Zelda brought her daughter to a company picnic, co-workers could not resist seeing and talking to her. Zelda made note that this attraction to her wasn't a symptom of a white tech workplace; it was a marker of whiteness in general. If Zelda went with her Black friends to the farmer's market, white people would hesitate to have a conversation; show up at the market with her daughter, and white people suddenly have the agency to cross racial lines and talk to Zelda.

I would not have believed Zelda had I not witness the phenomenon as I interviewed her for the first time in March at a diner. At one point, our server stopped and lingered at the table conversing with Zelda's daughter. She agreed with my analysis, that her white-passing baby made Zelda "safe." She found a different word to describe the behavior: "It's like a level of—there's this level of *acceptance*. Whatever. I don't know." Although coding literacy and all the employability skills that come with it make the workplace, well, work, whiteness tends to seek itself out in a culture of meritocracy, to find comfort, even when found on a Black person. It seeks a mirror image that's replicable. That's one reason Zelda settled into an all-white space without much push from stereotype threat on her coding. And Zelda was happy to take advantage of the position her daughter seemingly gave to her if that meant she could get ahead in the internship. By the time we finished our first interview at the diner, the

only challenge Zelda faced was trying to make computer programming fun. She was on a mission to find a new fun language among the abundance of languages the internship already had her use, such as HTML, CSS, JavaScript, JQuery, PHP, SQL, and SAS.

However, when we met again in August, at the end of Zelda's internship, fissures had grown and spread throughout the internship. It began with multiple people quitting the company. Before her supervisor went on maternity leave, the lead designer quit. "He was telling me like why he left," Zelda said. "He was telling me how much he hated our VP [Vice President]. I was like, 'Oh she's not too bad.' I didn't think she was too bad." And then another person left, a Clearwater Academy graduate that was in the same cohort as Zelda; this graduate also disliked the vice president because she "Doesn't give credit where credits due, overworks people, doesn't have any respect, takes the credit of everybody's work or something." This last bit of advice resonated with Zelda, as she slowly noticed these problems. Strike one was a problem that she had not thought about, even though it was an egregious slight on her coding literacy and labor. The company was going to host a conference for medical professionals; Zelda took on the task to design the website and the speakers' webpage. The vice president assembled the team, including Zelda's manager, to look at the page in-progress and give Zelda feedback. But Zelda wasn't invited to the meeting. Her manager was pissed but Zelda thought nothing of it.

Zelda did receive feedback after the website went live. However, the comment had less to do with the coding she did. The team loved the videos embedded on the website, but Zelda had nothing to do with the video itself: Zelda recalled, "They were like, 'Oh the content on this video was amazing. Whoever put this together is great!' And I'm like, "That's so funny because it was just on the spring conference site. It's the same video." Zelda had simply made the video stand out more by moving the play button to the top of the page. The content may have popped, but Zelda made it so. She did push for more comments that would give more insight on her web design skill. She emailed a few co-workers. Only one responded. This person said the video was great and the website itself followed accessibility guidelines well. She asked where the web design needed improvement. "And after I said that he's like 'Well I really wish the speakers were on the agenda.'" Zelda paused and began to spiral. None of the speakers were listed on the webpage; she had thought something happened to the code and the problem was on her. But then Zelda realized that the content wasn't her responsibility; someone else had not assigned speakers to the schedule. Zelda told the co-worker that the content would be published, but in the back of her mind, Zelda thought, "Damn really? Like that's what you want to say? Like—they're not linking with each other? But like the first two sessions have their speaker already

linked. So you scroll down to see that the rest weren't linked with each other yet. Like 'What the fuck?"" Zelda had positioned herself as a strong coder, despite finding the process and practice boring. Nevertheless, even full stack developers need code reviews and user testing on web designs. So her labor and time had been overlooked, and the web content needed to complete the website was in the labor and time of others who had not attended the peer review meetings.

Then strike two happened, and the problems started to become clear to Zelda. The story went like this: Zelda had to work remotely because her daughter was sick, so she and her co-worker Anna joined a team meeting via phone. She had liked the vice president up until this meeting. For the entire hour, the vice president never once acknowledged Zelda's presence; she did acknowledge and speak to Anna but did not even tell the team Zelda was on the call. And who joined the call was clearly available: you just go to webinar and see who is present, who is muted, everything. And Zelda was no stranger to the vice president: everyone knew everyone in the small company, and Zelda had been "nice as fuck" to the vice president from the first day of starting the internship.

The final strike came at the end of June, a month before Zelda' s internship concluded. Her manager was about to take maternity leave on June 28th. She wanted to know Zelda's plans for the coming July 4th weekend; Zelda had planned to travel but being an intern, she got all the pay with none of the benefits like getting a bonus or paid time off (PTO). Thus, she planned to do some remote work in her spare time. And so began the process of regulating her labor and coding literacy through bureaucracy: can Zelda work remotely as an intern? She and her manager understood that this was a given benefit, but the vice president caught wind of the idea. She denied the request to work from home. This opportunity, she argued, was for anyone on medical leave. Zelda had a chance to double down on that policy then, as she had gotten in a car accident several days before. The doctors diagnosed her with a concussion and with a stress disorder. She could still code but from home would help, and Zelda could still get paid. Although her manager argued for paid time off and even shared Zelda's medical reasons, the vice president still denied the request.

A slight on Zelda's labor; her time and labor wasn't acknowledged by her vice president. To be a valuable worker, you must feel valued. Your work must be acknowledged. Your name must be called. Grace must be given when policies on labor and health care overlap. Zelda may have navigated whiteness well, but other forces mitigated her worth and coding literacy practice. The barrage of slights on her labor and assets diminished Zelda's motivation to keep working for the final month of the internship. What was the point of giving respect when respect was not given back? Zelda found that they had

less care for everyone else; that is, if goals were met, people like the vice president had little care for the individual professional fulfillment of employees. The strikes coalesced into unbearable working conditions after Zelda's first manager left; without full support from her, Zelda was left adrift in a sea of cynicism, after her old manager had kept the respect flowing from upper management to herself. Without much support, and having her labor slighted multiple times, Zelda lost motivation to keep meeting deadlines. In the final month of the internship, Zelda planned to do the bare minimum and do that minimum quickly so she could do nothing for the rest of the workday. And still get paid. Zelda was prepared to make up excuses: "I can just tell my manager 'I was trying to work on this, trying to work on it but people keep asking me to do other shit. Like—So it didn't get done. Oops my bad.'" She had done what she was supposed to do. Finished all tasks. There was nothing left to do but get the final paycheck and go on her planned vacation.

Zelda had abided by the whiteness of her internship; with the help of her daughter and her own work ethic, she upskilled in coding literacy and increased her worth as a coder. Zelda's labor brought profit and reputation to an already established startup. However, doing everything "right" had not demonstrated her value to management. From ignoring her labor to withholding benefits that she could use for medical care; Zelda found the structures around coding literacy unwelcoming and unprofessional. In some ways, the company exploited her labor to their benefit without acknowledging how they gave value to Zelda.

Conclusion

Black adult learners encounter inequalities on two fronts after graduating from Clearwater Academy. The consequences of racism, in particular poverty, and being shut out from designing digital technologies. They hope the invitation to work in tech suggests a new direction in the history of the tech industry; that more Black people can get a seat at the table. However, the experiences of Black adult learners from Clearwater suggest otherwise. A systemic reprieve on the other side of coding literacy doesn't exist. That means for industry and computer science education, structures of inequality remain rigid. Participants feel the tight squeeze of inequality in life and inequality in the job market they hope to break into. Coding literacy locked down into typical design philosophies and expectations suggest that policies and practices—social and culturally informed policies—around who codes and why they code hardly promotes any justice-informed recruitment or change in design technologies from white spaces. While Black participants in this study believed in the power of coding literacy, and in some way still held onto the imagined possibilities

of their lives not only achieving social mobility but also using technology to claim independence in the labor market, coding literacy's close tie to a specific area of tech hindered literacy development at that point in their lives. If the idea was to extend their literacy development, and thus their place in the economy for financial gain, new standards in computer science and tech would recognize the value Black people do have that may not look like the standards or traditionally considered for assessment. Easing known microaggressions and equalities removes one wall for Black adult learners.

But in the meantime, their discourse about the job market and hopeful imaginations of a Black tech ecosystem—not a pipeline—suggest there's a better way to disperse Black people across many sectors of technology; although it sounds counterintuitive to the need for more Black coders engaged with designing technologies, we may think of coalition building that deploys multiple kinds of Black technical knowledge, from computer programming to design to hardware to project management, in private industry but especially in community engagement. Rather than a single pipeline from start to finish, consider the relationship between race, labor, and coding literacy as a network of large and small pipes transporting knowledge and literacy practices throughout the digital ecosystem. Once participants realized their sour position in the job market, they imagined other possibilities—they began ideating and acting on their existing knowledge to better position themselves. Legacy institutions such as community colleges and their information technology programs seemed more attractive than computer programming. Coding literacy joins an ecology of literacy repertories; it becomes an option, should an option arise, or a spirit to summon in the final stage of an interview battle, or it sits collecting dust as the tools of coding literacy in 2017 are supplemented by artificial intelligence in 2025, a technology Richard had no way of teaching to his adult learners.

These experiences paint a more nuanced picture of literacy development through the labor of tech companies. While they do confirm previous studies and reports that show how damaging local white tech companies can be to Black adult learners, they also show the ways coding literacy still echoes or resonates in their lives long after the computer code bootcamp concludes. Clarity has come to my mind multiple times while analyzing the data and writing this book. And the more I wrote and thought the more I gained clarity on how coding literacy rewards agency and independence. Kevin's big takeaway, for example, was not coding literacy or finding a job in software development; through that failure he noticed other skills and competencies: learning how to solve problems in his workplace as a hardware repair specialist and in his own family life. And then the pivot toward social services for children, a call back to his volunteering for Black LGBTQ+ youth in Sakowin. While

Black adult learners lose in the tech industry, they gain more for their personal lives and future educational pursues. Clearwater Academy's gift to participants far outweigh any job a graduate finds. Even Gerrard confirmed this idea: shifting from learning coding with women and BIPOC adults and then reinforcing his learning in an all-white internship only taught him to move above and beyond what white tech offered, beyond what white tech needed. He wanted to cultivate a world for the Black diaspora, to undo or avoid the consequences of tech capitalism and its policy of exploiting poor laborers in Congo. Although coding literacy had less value in many participants' lives, they did agree coding literacy had value to Black communities in general but not for the kinds of digital lives computer code bootcamps suggested in their own discourse.

Conclusion: Falling Through the Leaky Pipeline?

> As he spoke, the whole city was broken like a honeycomb. An airship had sailed in through the vomitory into a ruined wharf. It crashed downwards, exploding as it went, rending gallery after gallery with its wings of steel. For a moment they saw the nations of the dead, and, before they joined them, scraps of the untainted sky.
>
> – E. M. Forster, "The Machine Stops"

Zeus got out of the Army in March 2022. He had to readjust how he behaved, spoke, and thought in civilian life. Zeus was already familiar with shifting his language and body movements, so he was a recognizable regular citizen. In Clearwater Academy and after he graduated to work in design and volunteer to teach kids, Zeus had learned how to be "in a corporate environment." The Army stripped away those mannerisms and turned him into, in his words, a dog, a cub in a wolf pack. Zeus held onto his desire to expand his digital literacy practice. As noted in the Introduction, he had signed up for an online class in cybersecurity and read books for certification in Texas in a hot oven (the tank). His squad mates laughed at him: They didn't understand why an Army grunt needed more academic education, why learning anything other than what the government told him to learn was so important to Zeus. He was a little taken aback that these farmers and construction workers would denigrate his desire to learn. But he later reflected on the lessons he could learn from these children of blue-collar families turned into soldiers: despite a rough family life where his sister carried the financial weight of their mother and father while Zeus was out doing his "ratchet thing," he had some privilege. Zeus felt his privilege acutely when he returned to Sakowin and met old friends, who "were once part of a royal family, but the viciousness of a cousin or something, they took all the money or something like that. And now they're back at trying to pursue their own life. They didn't agree with the culture of their family." By the time we spoke again in January 2023, Zeus' family was doing well: sisters graduating from college, cousins having kids, siblings buying houses. Everyone including himself was doing well.

Zeus' friends made fun of him for wanting to learn but that didn't stop him. Zeus reenlisted with the National Guard (Russia's war on Ukraine, which had officially begun on February 24, 2022 scared Zeus; he was afraid he would

be stuck in a tank in the war) and began Advanced Individual Training in information technology (IT); he had not received security clearance yet so he couldn't watch IT workers use software like PowerShell, a scripting language for managing digital infrastructures, but Zeus could continue working with hardware like telephone and internet cables, wires for fire alarms, and preparing military vehicles for missions. A few days after our final interview, Zeus would be heading to Arkansas for what the National Guard called "a gentlemen's course," not basic training with boots in your face but classes like West Point: desks, computers, clean floors, and good air conditioning and heating. His pathway was already scoped out: Zeus planned to attend college in Sakowin and major in engineering and then capitalize on that knowledge for cybersecurity and community engaged work. Coming into Clearwater Academy in 2017, web design made sense but now, he said, the landscape had changed: it's not enough to build and design software; there's a huge market for protecting software. Ukraine relied on drones against Russia's army, Zeus noted, but ninety percent of those drones could be taken out by cyberattacks. Some drones gather intelligence—photos, video, and other kinds of data. They are flying computers, and like any flying computer, they have hardware that could be exploited by hackers. From his high vantage point in just military training, the world had entered an information war. People like himself must be on the frontlines. Zeus described coding literacy as a moving target, always responding to the needs of the market, of the economy, and national security.

He found a middle ground between the corporate environment Clearwater Academy trained him for and the wolf pack mentality of the Army. In that middle ground, he could use the full repertoire of his knowledge to protect national cybersecurity on one hand and teach future generations IT and web design. His professional life and academic training would circulate to the communities that funded his work through public tax dollars. What fueled his resolve, it seems, was the example Clearwater Academy set for him. As Zeus explained in Chapter 2, he could be a master of tech and now he could one day help others become masters themselves. Thus, the value of Clearwater Academy wasn't that it got him a job or that he could join the rank and file of white digital technology design; the value was changing his perspective on his life and the life of others, finding the wholeness of people around him, and that technology at its very best augmented those assets. From that perspective, Zeus understood Clearwater Academy was an organization for philosophical relief in addition to financial and social support. As he told me in our interview, "Dude, I'm telling you, man, Clearwater Academy really changed my life, dude! Clearwater Academy really changed my life, and everybody that I know, I refer them to like, every time like I run into someone that's struggling, I always say Social Justice Cooperative (SJC) or Clearwater

Academy." For me, Zeus had "discovered how [he] can develop and use technology not merely to fit within extant social systems but as means by which to construct new and emancipatory social systems (Scott & Elliott, 2019, p. 377). Critical imagination for coding literacy makes real the emancipatory social systems many Black people have strived to create.

Black Coding Discourse Reveals Black Tech Ecosystems

Computer code bootcamps respond to a new yet familiar call for more computer science education. The initial target of the movement is K-12 curricula adopted from state to state. While I question the logic that a software development crisis persists, I do think there's a *desire* for more software developers. Writing now in 2024, the advent of generative artificial intelligence pushes tech companies to compete. Following the logic of Silicon Valley dating back to the emergence of information technology driving global competition, these companies need to move fast to survive in the knowledge economy; calling for more experts in generative artificial intelligence and machine learning to drive innovative design makes sense. A desire, not a crisis. Nevertheless, expanding computer science education becomes a national effort that computer code bootcamps join. With intensive training based on the exact needs of the tech industry, computer code bootcamps meet the demand for more developers and other highly skilled technology positions. They can also target marginalized people, as the call for more coders coincided with intense scrutiny of diversity in the tech workplace. A host of disenfranchised and abandoned poor people await to meet the call. People like Zeus accepted the narrative that social mobility awaits; it's not just money that makes the bootcamp attractive nor the swift training: computer code bootcamps may appeal to marginalized people's already existing interest in tech but they never had the resources or time. Coding literacy and the social, material, and cultural structures that make coding literacy thrive can't carry the burden of solving poverty and racism. Coding literacy scrambles poverty around, at best, and then poverty returns to its original shape and size. However, I have argued that coding literacy—its unique processes for problem-based composing, its cultural practices embedded within tech companies and Silicon Valley specifically, it's emphasis on problem-solving and clear ideation of mental models for software, and even its attachment to whiteness—do reveal new truths about Blackness and computer programming.

I've argued in this book that if researchers, teachers, and sponsors interested in computer code bootcamps pay attention to what's happening on the ground for Black adult learners, they will find Black coding Discourse—the social languages used in conversations about coding literacy and its

sociocultural values and material tools that arise from practicing and doing computer programming. They interact with the ways of being and doing computer programming according to local majority white tech companies' figured worlds. I used the tools of qualitative research—interviews, participation observation, field notes, and collected literacy artifacts—to understand what this Discourse means for them and what they might imply for teaching emerging technologies in adult education. As they try to cross into a professional life for social mobility down a so-called tech pipeline, Black adult learners' experiences in computer code bootcamps illuminate other possibilities, desires, and needs not afforded to the coding literacy practices learned in Clearwater Academy and mismatched from the stated goals of many computer code bootcamps: social mobility and, for Clearwater Academy, addressing racism and poverty. My analysis of Black coding Discourse reveals that beliefs in coding literacy and interacting with its unique logics send significant Black assets to the surface that would not have been clear otherwise. These assets make up Black tech ecosystems—an ever-evolving environment where Black people develop a variety of knowledges, practices, and frameworks for navigating a computer code bootcamp and the software developer profession. Instead of traversing a leaky tech pipeline, Black people express communal coding literacy practice that might lead to adjacent career, opportunities, and relationships outside of Silicon Valley-inspired tech companies local to Sakowin and more holistically fulfilling than just social mobility. Across four chapters, I've tried to identify logics in Clearwater Academy that seem to promote anti-oppression or inclusivity and show how that may be deepened according to the logics that animates a Black tech ecosystem. Those logics include using low-waged work and technophilia to develop new work ethics that computer code bootcamps should fulfill; deep understanding of oppression to motivate carework in coding cultures; acknowledge computer code bootcamps' role as racial organizations using career training to uphold racial social order; and discovering the variety of ways coding literacy may add to their Black lives while being fine with moving on to other literacies that seem more promising. Taken together, Black tech ecosystems bring some reality to the coding literacy myth in popular discourse.

In Chapter 1, I revise the value of literacy work histories that show only low-waged work. Although Black women and their resumes may suggest they must be trained from the ground up because they have no computer programming or tech workplace experience, these adult learners show a rich conception of work ethics. Their technophilia throughout life coincides with harsh relationships with low-waged work opportunities that sent mixed messages about their worth as employees. The six Black women's literacy work histories I describe and analyze also show how some work constrained their

relationships, continuing a legacy of stripping Black women from being mothers and exploiting their bodies for white supremacy, in some ways mediated by the computer code that creates oppressive software. Years of gender and racial domination according to their labor helped Black women in this study make up an informed work ethic for technology that they expected Clearwater Academy and the opportunities attached to coding literacy will fulfill.

Chapter 2 addresses the limitations of diversity, equity, inclusion, and belonging as a response to histories of oppression and exclusion in tech. In Clearwater Academy, Black coders use carework to maintain the web of relationships needed to learn computer programming and build their digital literacies through these programs. Black adult learners sacrifice their life responsibilities that keep them afloat: work, healthcare, reliable transportation, and housing all get thrown influx under the intense curriculum of Clearwater Academy. Although SJC provides some social service, they did not have the resources to fully address the conditions of poverty: within the computer code bootcamp powerful care labor flows from person to person, and what drives that care as an asset is full knowledge of one another's struggles with systemic oppression. Carework goes far deeper than surface-level, quick practices of diversity and inclusion that more likely hides whiteness than confronts it. Taking stock of how oppression flows throughout coding cultures names bigotry and transforms workplace practices and relationships for justice, correcting racial inequities in collaboration with marginalized coders.

Chapter 3 reframes computer code bootcamps as racial organizations, not merely training programs. They take in the logics and standards of tech sponsors, and the software profession in general, and design curricula and assessment practices accordingly. As a racial organization, computer code bootcamps withhold and reward material resources for coding according to racial schemas defined by whiteness. Computer code bootcamps like Clearwater Academy have a foot in two different places that are always in conflict: social justice on one side and market logics of whiteness on the other. What ensues for instructors Richard and Jessica and the Black adult learners is a struggle for maintaining agency over their lives as Black coders. Their sometimes conflicting ideas on coding's value reveal philosophical agreement that Clearwater Academy unwillingly participates in a project to turn Black coders into unproblematic, disciplined functions for white tech industries. Adult learners imagine figured worlds separate from majority-white tech companies, one that's communal in nature and not totally subservient to racial capitalism.

Finally, Chapter 4 follows the attempt to break into software development post-graduation. Most Black adult learners in this study hit barriers: plenty of work opportunities but they do not have enough experience. Taking care of family and finances was more important than getting a job in tech; it was

faster to get a job somewhere else—working behind the scenes as a cook or as a document designer. Although presented as a powerful and unique literacy that could deliver big advantages, computer programming was more boring than amazing, more tedious, and harder than what it was worth. Job interviews and internships were locations of intense judgements on the worth of others, and those judgements hurt. Hard. Microaggressions and unacknowledged assets accelerated the sense that their worth as coders wasn't as valuable after all. The doors closed in their faces, interns strategized new pursuits, taking the conditions of labor into their own hands against a labor market not readily welcome to them. Coding literacy echoed in their personal lives and non-tech careers: organizing household chores, mixing graphic design with web design and entrepreneurship, and starting a business in user experience design. In short, the knowledge and processes of computer programming moved elsewhere or not at all.

Clearwater Academy instructors call the program a worksite, not a school. Their assessment model examines not only technical knowledge but workplace behavior. Black adult learners practice being good workers as coders; this model makes sense because coding literacy in a computer code bootcamp has a tight trajectory: learning to work. A common model for many computer code bootcamps. My analysis takes SJC at their word, then, and I interpret Black adult learners in this study learning to labor with computer programming. If I frame everything as human capital creation against the forces of racism and poverty, I find that we may miss the Black coding Discourses that construct their Black tech ecosystems. What matters more than coding literacy practice and knowledge is *what they get from the experience*: an opening up of how technology works in their lives and what they must do to, in the words of Zeus, master it. While these adults could have done any other kind of training, like going to college for IT, the coding literacy practices here provide deeper insight on how to construct their relationship with technology and work because of professional and cultural expectations not always shared with help desk support. In short, I discover they have new assets that don't fit onto any résumé or cover letter, that steer away from training for human capital whose value is understood best through an exchange of work for compensation.

The professional goals Black adult learners in this study imagined for themselves may sound like they carry on a capitalist logic; to make it in this world you must play the game. In her book *Desire for Literacy: Writing in the Lives of Adult Learners*, Lauren Rosenberg (2015) notes that adult learners ally themselves with opposition, which "remains attached to dominant ideology, in contrast to disruption that accompanies resistance" (pp. 5–6) Resistance seeks new power structures for race and class. Opposition means

survival within existing hegemonic order. Rosenberg examines how this allyship comes more from feeling the competing pressures between opposition and resistance. I think this study—especially Chapters Three and Four—extends this notion. As Kevin noted, it's hard to rectify inequities for Black people when their advancement relies on the interest convergence of white tech sponsors (Bell, 1980). However, when participants state their professional career interests post-graduation, they rethink how technology really works in their lives. Kevin leaves behind the gospel of coding literacy for a humbling and challenging career in child services, or Rosie deploys her digital literacy—not coding literacy—for community engaged work that supports Black women and Black women with lupus in Sakowin. Economic pressures do and sometimes do not flow through their literacy practices. Not disavowal of racism or capitalism but also not belief in its supposed benefits.

The power to make real change in tech may require more strategic thinking than what some can do. Alice had a family to support; DeAndre had to catch up on rent. Gerrard had a clear vision for creating a community for Black people by using his business knowledge and earning power as a venture capitalist. And a broadening industry of black talent does exist as accounted for in new media publications like *People of Color in Tech*. I find people like Gerrard carving out a space for themselves separate from Silicon Valley, even though their technologies partly rely on Silicon Valley's many services. Nevertheless, they invert priorities—themselves over white users. I do not mean to cast a pessimistic view on changing how tech works against Black people and other marginalized groups; I do think, having spent eight years studying computer code bootcamps for this book, *change is hard*. But most Black adult learners felt less communal responsibilities to others and more love and care for themselves and family. When they do feel that communal responsibility, they turn to Clearwater Academy; Clearwater Academy will set you right. They will help you. Knowledge about coding literacy circulates in these ways among Black adult learners in this study. Clearwater Academy stands as beacon for other low-income people of color and women. Their trust is well-placed it seems. In 2019 Clearwater Academy expanded its model in other cities.

A Critical Imagining of Coding Literacy Futures

What do these findings mean for the current coding for all movement and computer code bootcamps? Education and training for work is a fair goal in a capitalist society. As a I tell my adult learners in my professional and technical communication courses, I understand that you must feed yourself and your family. Perhaps community engaged work doesn't look very profitable. But

private industry and community engagement can overlap as a civic technology project (Harrell, 2020). For practical policies and curriculum, I imagine a coding literacy education that helps Black adult learners reveal ways that digital technology augments their existing lives. Rather than a project for laboring to labor with coding literacy they imagine multiple ways coding literacy can flow in their lives, even if that makes navigating the job market but only an *option*, an option with lots of caveats. Rather than a conveyor belt of workers, consider how literacy opens, how it flows, and Black people may flow with it.

This implication aligns with the early movement to expand computer science education in the 1960s. Mark Guzdial (2021) gave four keynotes in which he argued that "computer science was originally invented to be taught to everyone, but not for economic advantage." Well-known scholars in computer science like C.P. Snow, Peter Naur, and Alan Perlis advocated for a computer science education that decisions over how software is created and used should not be left to a few powerful people; for the sake of democracy, all people should know about the inner workings of computer science (Vee, 2017). Guzdial (2021) writes that computing education for work is "important and useful, but often eclipses other, broader goals for learning computing. … Computing for everyone is likely going to look different than the computing we have today which has been defined for a narrow set of goals and for far fewer people than 'all.'" His *Learner-Centered Design of Computing Education: Research on Computing for Everyone* (Guzdial, 2015) outlines a clear picture of what coding literacy looks like for multiple uses across the human experience. His work exemplifies my point here with a tighter focus on Black experiences and digital technology. Overlapping with this broader goal for computing for everyone would be teaching computer programming through a critical race technology theory framework (Tanksley, 2022, 2023). Under this perspective, computer code bootcamp curriculum resist positive stories about technological progress. They would not necessarily teach critique but rather draw out and draw on Black people's existing thoughts about digital technology and address how technology supports whiteness and white supremacy. They become critical makers positioned to seek new approaches to design that's collaborative and social-justice focused.

Second, the caveats for going into tech while Black are stern warnings about ecologies that make up tech industries: computer science programs, computer code bootcamps, extracurricular activities for youth, and tech companies are all implicated in coding literacy for capitalism. Tech sponsors could do their own interventions. Racial capitalism structures our lives, determines who gets ahead and who doesn't. Labor participates in that decision-making. Put simply: the culture doesn't work. Teaching the ways the tech industry supports, collaborates with, and instigates existing systemic bigotries in

a computer code bootcamp perhaps matters more. There are books written in clear accessible language that accounts for these vast disparities in tech. Rather than call in Black people to be coders, call out those industries tightly winding racism and whiteness around computer programming. Other bigotries like sexism and heterosexism determine how marginalized coders move up or down the ladders of success. To break occupational segregation is to center marginalized people. Corporations are not new to adapting to "outsiders" and "misfits." Coders themselves were once seen as an unruly, unkempt, and socially awkward group when their professions took off in the 1960s. Tech journalist Clive Thompson devotes a chapter in his book *Coders: The Making of a New Tribe and the Remaking of the World* to the many personal, emotional, and mental characteristics of coders and how they work together in office settings, for example, and even continues to note the personalities of famous coders throughout the text. Ironic that tech sponsors and employers tell Clearwater Academy that they train marginalized people unprepared for their offices when they have gone from being outsiders to being the main drivers of our digital lives. However, until tech cultures re-tool their flexibility for Black coders, we may look to a new model of computer code bootcamp that assists in evenly distributing Black talent across the sectors of tech, from design to product management to maintaining software. This new focus on promoting Black people's broad participation in tech, not just computer programming alone, would reimagine the coding for all movement as the tech for all movement.

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Black Tech Ecosystems reports on a year-long ethnographic study of low-income Black adult learners attending Clearwater Academy, a nonprofit computer code bootcamp that teaches coding literacy to help end racism and poverty. While Clearwater Academy offers pathways into a lucrative career that promotes Black social mobility and a diverse tech industry, Antonio Byrd describes a more complicated story. The core challenges of weak social-support networks, embedded cultures in tech, financial strains, and racism persistently present roadblocks to Clearwater Academy's Black adult learners' success. However, through this experience, Black adult learners develop new knowledge and frameworks that change their relationship with coding literacy and labor. Instead of solely focusing on learning computer programming for work, *Black Tech Ecosystems* describes a liberatory and transformative use of computer programming that centers Black lives instead of the tech industry.

Antonio Byrd is Assistant Professor of English at the University of Missouri Kansas City, where he teaches courses in professional and technical communication, multimodal composition, composition pedagogy, qualitative research methods, and Black digital rhetorics. His research focuses on how the legacies of using literacy for liberation carry forward into present day Black digital literacies and media features. His work has appeared in *Composition Studies*, *College English*, *Technical Communication Quarterly*, and *College Composition and Communication*. In 2021, his article "'Like Coming Home': African Americans Tinkering and Playing toward a Computer Code Bootcamp" received the Richard Braddock Award for best article in *College Composition and Communication*.

#WRITING
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