



Research Perspectives in Urban Education

How Integrating Quilt-Making with Computation Supported Black Teens in Reimagining Liberatory Futures with Emerging Technologies

Abstract

In light of calls for more arts integration in STEM and computing education, an initiative called *restorying through design* offers Black girls a context for both integrating African American quilting practices with computation and interrogating and reimagining oppressive narratives about emerging technologies. Using grounded theory, Black feminism, and womanism as lenses, I analyzed the design artifacts and reflections of three Black girl participants from a workshop I developed and implemented in 2021 where fourteen nondominant youth used electronic textiles to design interactive quilt patches to restory dominant narratives about computing technology. In the findings, I discuss how

participants' quilt patches reimaged technology futures that valued wellness and inclusion. Lastly, I consider the possibilities for self-definition, empowerment, and belonging among Black girls *restorying through design* together in community, ending with potential sociopolitical and ethical considerations when designing learning environments that engage Black girls and other nondominant youth in *restorying through design*.

Keywords

[restorying](#), [quilt-making](#), [Black feminism](#), [womanism](#), [emerging technology](#)

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With growing anxieties surrounding the future of emerging technologies, nondominant youth need learning opportunities to examine technology's role in

current injustices. There is a pressing need for scholarship supporting youth to interrogate the “conceptual glue” that binds systemic inequities and emerging technologies and that is “used to justify dominant narratives that seek to explain why things are the way they are” (Rankin et al., 2021, p. 268). Through awareness and commitment to issues of power in society, nondominant youth can develop the agency to imagine new futures with technology (Vakil, 2018). Given the evidence of Black girls using digital media tools to “restory” normative and deficitizing narratives impacting their lives (Stornaiuolo & Thomas, 2018; Thomas & Stornaiuolo, 2016), *restorying through design* offers a speculative approach for Black girls to decode narratives and myths that shape how emerging technologies marginalize nondominant communities, particularly Black women, girls, and femmes (Jones & Melo, 2020), and helps them reimagine more liberatory futures with technology (Shaw et al., 2023).

This paper presents findings from a workshop I implemented during the spring and summer of 2021 in which a diverse group of 14 nondominant youth from a local museum STEM program designed and programmed interactive quilt patches that restoryed dominant narratives about computing technology. As an artistic medium that Black women have used throughout history to restory their lived realities, quilt-making offers a possible context for adolescent Black girls to interrogate and reimagine their futures with emerging technologies. Using Black feminism and womanism as analytical lenses (Collins, 2000; Phillips, 2006) to center Black women’s knowledge of intersecting oppressions and everyday practices of resistance and healing, I analyzed the *restorying through design* experiences of three Black girl participants, asking, “How did participants’ *restorying through design* practices reflect Black feminist and womanist perspectives and methods of social transformation?” Finally, I discuss the unique possibilities for self-definition, empowerment, and belonging among Black girls *restorying through design* together in community, ending with potential sociopolitical and ethical considerations when designing learning environments that engage Black girls and other nondominant youth in *restorying through design*.

Background

Engaging Black Girls in Restorying Through Design

Restorying through design offers Black girls and other nondominant youth a speculative approach for interrogating and reimagining dominant narratives, — explanations, stories, or myths that are told in service of the dominant social group’s interests and ideologies (“Dominant Narratives”, n.d.)—about emerging technologies. Despite persistent myths about technology being value-neutral and capable of solving societal problems (Morozov, 2013), programmers continue to unconsciously embed stereotypical beliefs in the technical coding of software programs (Benjamin, 2020), like when online search results associate Black names with arrest warrants (Sweeney, 2013) or Black girls with hypersexualized content (Noble, 2018). Therefore, it is important that Black girls develop a complex understanding of how narratives and myths shape the design and use of emerging technologies and develop strategies for mitigating these risks.

In the current digital age, restorying characterizes the complex ways nondominant youth present the realities of their everyday worlds, situate those realities within historical practice and current discourses, and tell new stories based on marginalized perspectives that imagine possible futures (Stornaiuolo & Thomas, 2018; Thomas & Stornaiuolo, 2016). Whether through social media activism (Stornaiuolo & Thomas, 2018) or racebending popular characters on fanfiction sites (Thomas & Stornaiuolo, 2016), Black girls have used digital tools to challenge the misrepresentation or omission of their stories throughout mainstream mass media and then rewrite new narratives based on their lived realities. In terms of interrogating and reimagining possible futures with emerging technologies, *restorying through design* builds on speculative design, which centers on imagining alternative ways of being (Dunne & Raby, 2013) and culturally responsive computing, which argues that 1) all learners are capable of digital innovation, 2) learning environments should support transformational uses of technology, 3) and technology should be a vehicle for nondominant youth to reflect, demonstrate, and understand their intersectional identities (Scott et al., 2015). Similar to how constructivist artworks are aimed to “awaken the masses and lead them towards awareness of class divisions, social inequalities, and revolution” (Wolfe, n.d.), *restorying through design* allows nondominant youth to create with emerging technologies and “develop the agency required to make the changes they want to see” in the world (Lee & Soep, 2016, p. 481).

Historically, nondominant communities have repurposed technology innovatively to sustain their communities and challenge their marginalization (Gaskins, 2021). Black women in particular have used quilt-making as an art form and

sociopolitical tool to resist oppression—from communicating coded messages for escaping slavery to preserving their cultural pasts (Cash, 1995; Davis, 1998; Porter, 1990; Tobin & Dobard, 2000). Community-wise, Black women from the remote town of Gee’s Bend, Alabama first turned to quilting due to survival needs, but by passing down patterns and piecing styles across generations and organizing the Freedom Quilting Bee in 1966, they achieved economic independence and ultimately created a new art form (see Figure 1a; Antonacci & Gross, 2015; Beardsley et al., 2002). Individually, Black women have used quilt-making to have agency over their stories and resist the oppression that came from being Black and a woman in the United States (Cash, 1995; Davis, 1998). In Figure 1b, contemporary quilter Bisa Butler creates vibrant, photorealistic quilts that recreate old photographs of Black people to reimagine the past (Demerdash, 2021). Building on this historical legacy, *restorying through designing* quilts provides Black girls a unique context for critiquing the marginalizing forces that shape technological systems. Similar to culturally situated design tools (Eglash et al., 2013), integrating emerging technologies with Black heritage practices affords Black girls the opportunity to reimagine more liberatory futures that center their lived experiences. However, there is a need for theoretical frameworks and methodologies that support nondominant youth in decoding technology’s role in systemic oppression.





Figure 1

(a) A family in Gee's Bend, Ark. Sewing a Quilt (source: Virginia Museum of Fine Arts), and (b) One of Bisa Butler's Quilts (source: CNN)

Black Feminism and Womanism as Theoretical Frameworks

As culturally relevant perspectives, Black feminism and womanism offer alternative methodologies for critiquing emerging technology's role in oppressive systems. Black feminism discusses African American women's development of a self-defined, collective standpoint about Black womanhood in order to "talk back" against negative representations in dominant discourses (Collins, 2000; hooks 1989), disrupt the normative order, and reimagine a world rooted in respect, justice, and equality (Brewer, 1993). In other words, Black women established Black feminism as a critical lens for understanding the intersectional experiences of being Black women in the United States (Collins, 2000). Toward goals of self-definition and empowerment, Black women used quilt-making to present the realities of their everyday worlds and situate those realities in historical contexts, both key restorying practices (Stornaiuolo & Thomas, 2018).

Alternatively, as a social change perspective with goals of ending *all* forms of oppression for *all* people, womanism honors "Black women's and other women of color's everyday experiences and everyday methods of problem solving" (Phillips, 2006, p. xx). More than a theory, womanism is a worldview that positions spirituality as the foundation of social change and argues for "tracing the origins of social and environmental problems back to their roots in terms of human thought and feeling" in an effort to "envision a desired outcome" (Maparyan, 2012, pp. 51-52). Womanist methods for bringing about this desired outcome aim to restore balance between humans, nature, and the spiritual realm (Phillips, 2006). Through methods like mutual aid, self-help, and healing, Black women quilted together in community to confront "violence and oppression wherever and whenever they appear across the course of a day" (Phillips, 2006, p. xxx).

With regards to *restorying through design* possible futures with emerging technologies, Black feminism offers an analytical perspective for examining how the design of emerging technologies interacts with negative, stereotypical portrayals or "controlling images" of Black women (Collins, 2000). Moreover, womanism offers perspectives for reimagining narratives about technology that "cohere around the activities of harmonizing and coordinating, balancing, and healing" (Phillips, 2006, p. xxvi). Both perspectives center Black women's, girls', and femmes' knowledge and lived experiences to not only critique harmful

consequences of emerging technologies but also reimagine alternative ways of thinking about and being with future technologies. Applying Black feminism and womanism as theoretical frameworks, I propose African American quilt-making as a possible context for engaging Black girls in *restorying through design*.

Drawing from constructionist learning theory, which frames constructing knowledge as the creation of computational artifacts (Harel & Papert, 1991), *restorying through design* builds on existing scholarship that understands artifacts not just as products of learning but also as ideational resources for facilitating learning (Vakil & McKinney de Royston, 2022; Vossoughi, 2014). Constructionist learning environments center learners' experiences, values, and perspectives and invite them to use technologies and tools to bring ideas, theories, and objects into being (Holbert et al., 2020).

With regard to restorying dominant narratives about emerging technologies, I report on an informal STEM workshop I developed and implemented during 2021 in which I engaged nondominant youth in designing interactive quilt patches using electronic textiles (hereafter, e-textiles), or fabrics embedded with microcomputers, lights, and sensors stitched together using conductive thread and programmed to perform various actions (Buechley et al., 2013). Not only do e-textiles integrate crafting with emerging technologies, but the process of designing and programming an interactive quilt patch can also help learners better understand the impact of physical computing systems on users. Furthermore, youth will be able to leverage the communicative affordances of both quilts and computational technologies when crafting their restories. As an arts-integrated approach for promoting social change in STEM and computing education, African American quilt-making practices provide analytical and conceptual tools for designing learning environments where Black girls and other nondominant youth use design to *restory* narratives and myths impacting their experiences with emerging technologies.

Methods

Study Context

The workshop emerged from a longstanding partnership over the last decade between a university and the Science Advocacy Program (SAP, a pseudonym), a

four-year, college-and-career-focused STEM program for select 9th through 12th graders attending local urban high schools. Housed within a local science museum in an upper-eastern, U.S. city, SAP aims to increase the matriculation of marginalized youth in STEM fields through two-hour weekly programming during the academic year and a five-week daily summer program. The type of student targeted is one who not only shows aptitude and interest in STEM and a need for additional resources but also shows a commitment and passion for learning a range of STEM topics. Since 2019, I have employed design-based research methods (Design-Based Research Collective, 2003) to co-develop and implement workshop units to engage first-year SAP participants in the process of *restorying through design*. An important methodology for understanding why and how certain educational innovations work in practice, design-based research can contribute to theories of learning and teaching by reflecting a commitment to understanding the relationships among theory, designed artifacts, and practice (Design-Based Research Collective, 2003).

I report on the most recent implementation of the workshop during the spring and summer of 2021 when SAP transitioned back to in-person programming following the COVID-19 pandemic. In May, the first part of the workshop was conducted on Zoom for two hours over the course of five weeks during the after-school program. The workshop continued in-person during the second half of July as part of SAP's summer programming, in which participants met at the museum for 3.5 hours daily over the course of 10 days. During the second part of the workshop, participants engaged in *restorying through design* practices by designing interactive quilt patches that restoried dominant narratives about computing technology.

Each day, I facilitated whole-group discussions during which participants interrogated narratives and stories about technologies of the past (e.g., dominant and marginalized histories of computing), present (e.g., racist Snapchat filters and predictive policing software), and future (e.g., science fiction). In addition to examining narratives, participants engaged in design activities with e-textiles (e.g., Micro:bit microcontroller, multicolored LED lights, conductive thread, and felt) to develop the coding, circuitry, and crafting skills necessary to design their quilt patches and to embed disciplinary concepts with criticality. For example, when learning about the light sensor function on the Micro:bit, participants discussed Joy Buolamwini's work on algorithmic bias. On the final day of the workshop, the youths exhibited their quilt patches to various SAP staff and youth,

as well as added their individual quilt patches to a piece of fabric to create one collective quilt.

Given the relationship developed with SAP's director of youth programs since 2017, I trusted her with recruiting participants from the 9th-grade cohort to the study, as well as disseminating and collecting digital assent and consent forms from the 14–15-year-old workshop participants and their parents or guardians. Out of the 13 participants, 11 consented/assented to participate in the study. Based on demographic data from SAP, consenting participants included 6 male and 5 female youth, who identified as 7 Black/African American, 2 Asian, 1 White, and 1 other. In terms of research positionality, I am a Black woman learning scientist and former STEM educator who uses project-based and constructionist learning approaches to engage nondominant youth in learning STEM, and I have implemented workshops at SAP for the last seven years. While I was in charge of facilitating workshop activities, I was assisted by three graduate student researchers who collected data and supported participants with troubleshooting design issues. The graduate student researchers, all of whom are international students in the School of Education, included a male Latinx doctoral student with a background in computer science as well as two female Asian master's students with expertise in art and design.

Data Collection and Analysis

Data collected consisted of 1) video observations and field notes captured by the graduate student researchers; 2) participants' daily exit tickets and final survey responses; 3) participants' online design journals; and 4) participants' quilt artifacts (i.e., quilt patches and video/slideshow description of quilt patches). For this paper, I focused my analysis on the *restorying through design* experiences of three Black girl participants: Nia, Larry, and Britney. Britney, who worked with a white/Hispanic boy named Bunce, sat at one table while Nia and Larry, who were fast friends, sat at another table together. I chose to focus my analysis on these three participants because I wanted to center the technology experiences of Black girls. There were two other potential Black girl participants, but since they were absent on the final showcase day and never completed their demographic surveys, their quilt patches were not included in my analysis.

My analysis drew on deductive, qualitative methods (Miles et al., 2019). I organized all of the available data for Nia, Larry, and Britney, which included

photos and videos of their quilt patches, transcripts of their quilt descriptions from videos, design journals that consisted of project documentation and reflections, exit ticket/final survey responses, and relevant sections of observation field notes. The analysis involved identifying the youths' dominant and restoryed narratives/perspectives about computing technology, the visual representation of that narrative being restoryed in the design of her quilt patch, and interaction design. To better understand how the youths' *restorying through design* practices reflected Black feminist and womanist perspectives and methods of societal transformation, I deductively applied Collins's (2000) four major characteristics of Black feminist epistemology and Phillips' (2006) womanist methods of societal transformation.

Table 1

Description of Participants and Their Quilt Patches

Participant	Gender	Race/ethnicity	Dominant narrative/perspective	Restoryed narrative/marginalized perspective
Nia	F	Black	I'm always happy or in a bad mood/Others in society	Mental health matters/Self
Larry	F	Black	Video games and basketball are just for boys/Video game developers	Women play video games and basketball/Women gamers and basketball players
Britney	F	Black, white, Hispanic/Latino	Phones are always good (teenagers) or harmful (adults)/Adults	if you're spending too much time on your phone, you'll have to sacrifice the time for other things, like studying/Teenagers

Findings

In this section, I present Nia, Larry, and Britney *restorying through design* artifacts and perspectives. Analyzing their data revealed how they restoryed narratives about technology and mental health and inclusion in the design of technology. By highlighting these three quilt patches in particular, I discuss the possibilities for empowerment, self-definition, and healing when Black girls design artifacts that critique oppressive narratives from their lived experiences with emerging technologies and reimagine those narratives to envision more liberatory futures.

Finding 1: Restorying Narratives about Technology and Mental Health

Reflecting womanist methods of physical healing and wellness (Maparyan, 2012; Phillips, 2006), Nia and Britney designed quilt patches about restorying people's relationships to emerging technologies and mental health, specifically social media (Nia) and smartphones (Britney). While brainstorming ideas for her quilt patch, Nia knew that she wanted her quilt patch to illustrate how social media can affect individuals negatively and positively, as well as to highlight the importance of "feeling your emotions through the struggles" (exhibit showcase). Titled "MENTAL HEALTH MATTERS," Nia's quilt patch displayed six Brown-faced emojis descending from sad to happy (see Figure 2a). Even though she did not program her patch to be interactive, Nia included a parallel circuit with one green LED and one yellow LED inside the emojis, and she used the Micro:bit as a battery source. Rather than depicting a reality where "happy" is always "bright" and "sadness" is always "not happy," Nia's quilt patch depicted a spectrum of emotions. Even though she did not specify what dimension of computing technology she was restorying, she included in her quilt patch a grid displaying four social media applications: Snapchat, Twitter, YouTube, and Instagram. One possible interpretation could be that Nia wanted to address the negative impact of social media on adolescents' mental health; another interpretation could be that she was highlighting how these apps could be used to spread awareness about mental health issues.

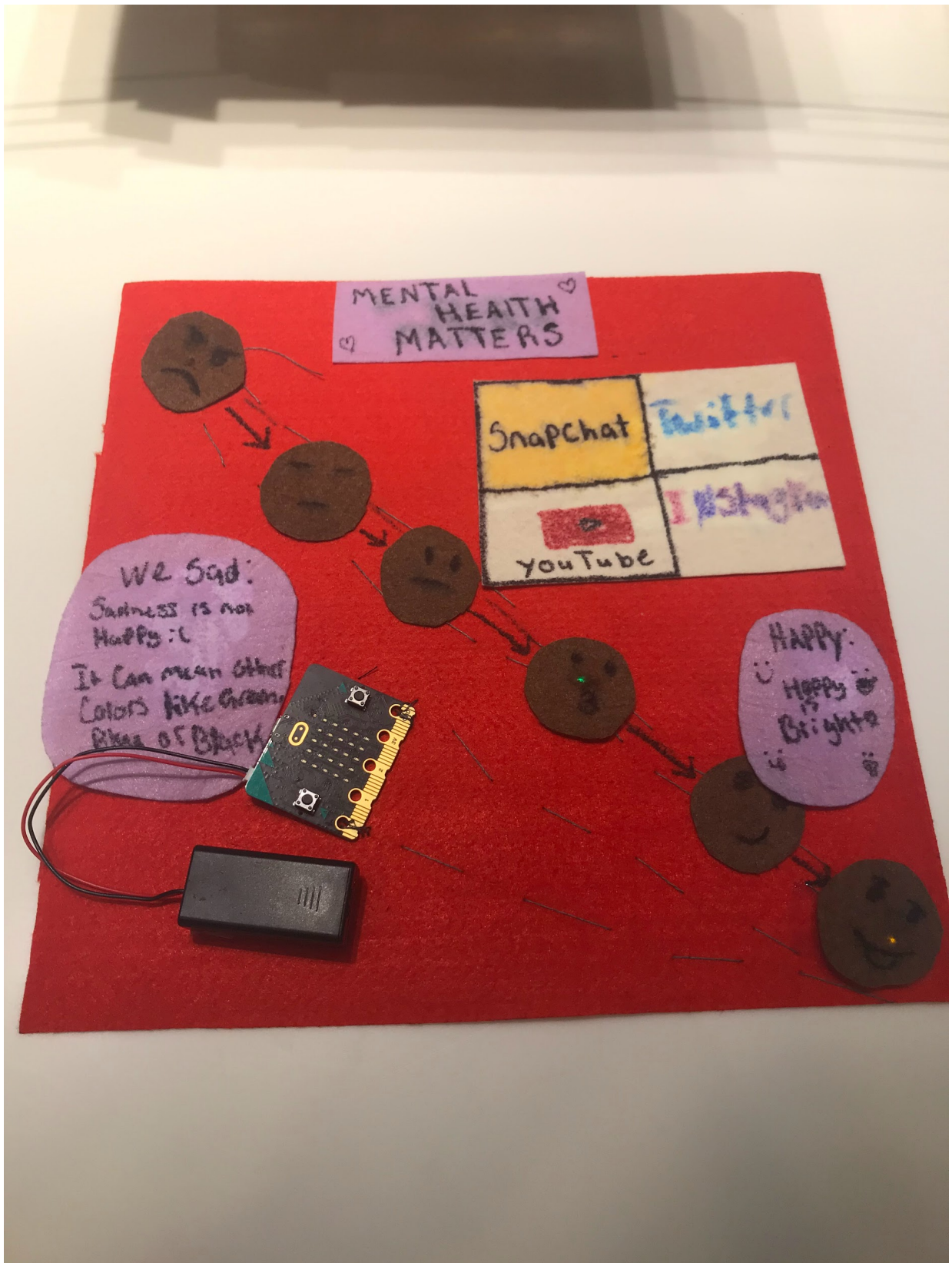




Figure 2

(a) Nia's Quilt Patch, and (b) Britney and Bunce's Quilt Patch

Wanting overall to restory the assumptions other people make about her emotions, Nia ultimately designed her quilt patch to illustrate how she is “not always happy” and “not always in a bad mood” (exhibit showcase). By rooting her *restorying through design* practices in her own experiences with emerging technologies like social media, Nia demonstrated Black feminist goals of self-definition and empowerment. As a Black girl, Nia created a quilt patch that defined her own reality, similar to how Black women invoke examples from their lived experiences as a criterion for meaning (Collins, 2000). “I haven’t made it yet but I want it to express me and life or what I see as life for me,” she reflected in her design journal, “I want to express my feelings as well.” From a Black feminist perspective, Nia demonstrates how Black women, girls, and femmes leverage social media to challenge stereotypical, “controlling images” (Collins, 2000) and establish positive self-definitions (Rogers et al., 2021). Based on what can be assumed to be her experiences with social media, Nia was empowered to create a quilt patch that restorys mainstream beliefs about mental health and the ways it is impacted by social media. In reflecting on her overall experiences of *restorying through design* via integrating quilt-making with computation, Nia expressed enjoying the activities and “related to it a lot” (final survey).

Shifting from social media to smartphones, Britney and her partner’s quilt patch

restoryed the dominant narrative that phones are either always good or always bad (see Figure 2b). In a video demonstration of their quilt patch, Britney explained how “teenagers spend too much time on their phones,” which negatively affects their study habits. Despite arguing that phones by design aren’t harmful, Britney and Bunce wanted their project to show that “if you’re spending too much time on your phone, you’ll have to sacrifice the time for other things, like studying” (Bunce, video demonstration). In their quilt patch design, they illustrate the choice teenagers have to make regarding their smartphone use with a scale of justice, with a phone on the left scale, good grades on the right scale, and a three-LED circuit inside them. In terms of interactivity, Britney and Bunce programmed the Micro:bit to display a game for the audience to choose between the smartphone or the good grades.

Similar to Nia, Britney’s quilt patch reflected womanism’s emphasis on “physical healing and methods of reconciling body, mind, and spirit” as methods for social transformation (Phillips, 2006, p. xxvi). During a class discussion on humanity’s relationship to technology, Britney described technology as “addictive” and shared a story she heard about someone who had died on the subway because “they were looking at their phone” (field notes). This notion of technology being addictive was shared by most youth in the workshop, as several participants expressed not being able to live without their smartphones. By restorying a healthier, more intentional relationship with one’s phone, Britney and her partner’s quilt patch reflected the womanist belief that “entrenched social and environmental problems originate from a psychological and/or spiritual first cause” (Phillips, 2006, p. xxx). However, despite finding the conductive thread and ability to program lights interesting, Britney was not sure what she thought about restorying dominant narratives.

Finding 2: Restorying Narratives of Inclusion with Technology Design

In her quilt patch, Larry restoryed narratives about *whose* stories are centered in the design of emerging technologies. Whether explicitly or implicitly, she interrogated and reimagined Black women’s, girls’, and femmes’ experiences with gaming, and when analyzed through the lenses of Black feminism and womanism, Larry not only named and historicized women’s—particularly Black women’s—stories being omitted in the design of video games, but she also designed a quilt patch restorying more inclusive narratives in video game design.

Focusing her patch on the design and impact of the NBA 2K video game series, Larry noted that a 2K game did not exist for girls like her who play both video games and basketball. Therefore, she designed her quilt patch to represent an advertisement for a WNBA 2K game released in 1999— the same year that the first NBA 2K game was released by developers.

In the design of her quilt patch, Larry placed an orange WNBA logo (with the word “1999” written inside the basketball) on the left side of her tan-colored quilt patch, which looked as though it was emerging from a large title that read “WNBA 2K” (Figure 3). The Micro:bit was sewn above the title and displayed a bright left arrow with the LED matrix. In terms of interaction, Larry programmed the Micro:bit by using buttons and the built-in touch and sound sensors to instruct the user to “animate” the advertisement. Although she programmed images to display on the Micro:bit LED matrix when certain buttons were pressed, Larry decided not to include any sewn circuits in her final quilt patch.

While creating her quilt patch, Larry reimagined an alternate history in which the first NBA 2K and WNBA 2K video games were released at the same time. Rather than *restorying through design* in a vacuum, she demonstrated the restorying practice of situating her reality of emerging technologies (as well as the realities of other Black women, girls, and femmes) within a historical context (Stornaiuolo & Thomas, 2018). In her design journal, Larry stated that the belief that video games and basketball are “just for boys” compares to “the history of computing and the belief that primarily or only men are involved in it.” While drawing historical links, she addressed how men are positioned as the authority of knowledge with regard to designing emerging technologies.



Figure 3

Larry's Quilt Patch

In designing her quilt patch, Larry chose a topic that “heavily applies to [her]” and restoryed a dominant narrative that she had resisted before (design journal). As a Black girl, Larry drew from her everyday experiences with sexism to define her own reality, a criterion for meaning within Black feminist epistemologies (Collins, 2000). Identifying as a gamer and basketball player, she wanted her patch to represent the experiences of “women who play basketball and who are interested in the WNBA” and “how they aren’t thought about when games are created” (design journal). By reimagining a past when “women [...] have their game of the WNBA as men have their NBA game to play with their favorite basketball players” (video demonstration), Larry interrogated and reimagined normalized beliefs that playing both video games and basketball are “just for boys” (video demonstration). Identifying boys as the dominant social group, Larry centered her quilt patch on the marginalized perspectives of women who play basketball and video games. In a TikTok video demonstrating the interactivity of her quilt patch, Larry explained that her quilt patch was “a counter-narrative that women can be interested in video games (more specifically NBA 2K games) and that they also should have a game that includes their stories” (design journal). Through creating her quilt patch, Larry restoryed an alternate history when video game design was more inclusive to women and their stories. Overall, Larry really enjoyed integrating quilt-making with computing and educating herself on topics that are often not discussed publicly but which affect her.

Discussion

This paper analyzed the *restorying through design* artifacts and practices of three Black girl participants who integrated quilt-making with emerging technologies to reimagine technology’s impact on mental health and inclusive technology. Despite differences in how Nia, Britney, and Larry leveraged computing practices, they all expressed having positive experiences integrating the disparate fields. Coupled with differences in participants’ experiences with engaging in restorying practices (e.g., Larry not sewing any circuits or Nia programming her LEDs), further analysis is needed on how participants navigated leveraging both computing and restorying knowledge and practices throughout the design process. Their lack of confidence in one dimension of the project (whether it was restorying, programming, or crafting) may have had an impact on the clarity of their (re)stories.

Even though the youths' quilt patches were created and analyzed individually, African American quilting practices offer analytical and conceptual tools for seeing what Toliver (2021) called "the seam connecting [...] stories" and how individual stories can "connect to an experience larger than the individual" (p. xxvi-xxvii). Historically, Black women used piecing (sewing scraps of cloth together) and appliqué (stitching small pieces of cloth on top of larger pieces) as techniques for designing their quilts (Jaynes, 2005). With participants' individual patches being added to a collective digital quilt, "piecing" and "appliqué" offer conceptual tools to support Black girls to "weave together" their individual experiences with emerging technologies and the experiences of other Black girls in the learning environment and the broader experiences of Black women, girls, and femmes (Toliver, 2021). In other words, situating *restorying through design* practices in the aesthetic, collective, and political qualities of African American quiltmaking provides a unique context for supporting Black girls in interrogating and reimagining oppressive narratives about emerging technologies. Therefore, we need scholarship aimed at supporting Black girls and other nondominant youth in using quilt-making to "weave" their individual stories together and reveal the common "threads" of oppressive forces shaping their collective experiences.

However, there is risk involved when Black girls and other nondominant youth share their lived experiences with intersecting oppressions and potential "pain stories" (Tuck & Yang, 2014) with diverse audiences. Given that Nia, Britney, and Larry were participants in a STEM program for nondominant communities across race/ethnicity, citizenship, and class, they may have shared their stories with peers who may not relate to their lived experiences. Therefore, additional attention was given to building community among participants before diving into more personal topics by setting norms, sharing fears and hopes for engaging in political conversations, and engaging in get-to-know-you activities. When considering the possibilities of designing learning spaces exclusively for Black girls, the process of exchanging "pain stories" with emerging technologies with other Black girls while *restorying through design* invites opportunities for engaging in the Black feminist–womanist storytelling goals of self and communal healing from negative experiences. Through testimony, "the audience is asked to vicariously experience what the testifier has gone through and affirm the storyteller as a source of legitimate knowledge while also agreeing to do something with that knowledge beyond a mere personal change" (Toliver, 2020, p. 510). Future studies are needed to illustrate how Black girls *restorying through design* through quilt-making can foster a sense of belonging and collective

identity, allowing them to define and redefine their humanity while also forming community with others familiar with their lived experiences (Tarpley, 1995, p. 3).

In conceptualizing how *restorying through design* can support nondominant youth in interrogating oppressive narratives and reimagining possible futures, Black feminism and womanism offer analytical perspectives for considering the multiplicative effects of race, class, gender, and other forms of oppression facing Black women, girls, and femmes and their methods of resistance. Given that computing education scholarship has leaned towards positivism (Berglund et al., 2006; Malmi et al., 2010), which champions objectivity and measurability, Black feminism and womanism offer alternative epistemologies for challenging positivist research that produces deficit-oriented scholarship reinforcing one-dimensional views of Black women and girls as “the problem” (Lindsay-Dennis, 2015). Across participants’ quilt patches, we see Black girls as gamers and basketball players (Larry), as well as advocates for mental health (Nia) and less addictive relationships with our smartphones (Britney). Through centering Black girls’, women’s, and femmes’ marginalization from emerging technologies, leveraging African American quilt-making histories and building on Black girls’ multimodal rewriting practices (e.g., Price-Dennis et al., 2017), *restorying through design* from a Black feminist–womanist lens can provide rich sites of knowledge production for understanding, critiquing, and reimagining emerging technologies’ roles in systems of oppression.

That being said, there are sociopolitical and ethical dimensions to consider. One concern is the ethics of moving restorying—which has largely occurred by nondominant youth in online communities outside of school contexts (Thomas & Stornaiuolo, 2016)—to learning environments (Coleman, 2021). When integrated into curriculum and pedagogy, educators and scholars must consider the potential harms of representation of youth across differential lines of power and consider whose stories youth from dominant, privileged communities have the right to tell (Coleman & Hall, 2019; Coleman, 2021). To avoid educational research extracting stories rather than thoughtfully (re)telling them through a lens of racial and colonial violence (Robinson, 2020; Toliver, 2021), individuals from dominant, privileged communities must interrogate the questions of “why?,” “for whom?,” and “toward what end?” with regard to engaging nondominant youth in storytelling/story listening activities. That being said, *restorying through design* cannot focus on developing the critical consciousness of nondominant youth while those in power are allowed to rest easy without making any substantial

systemic changes (Jones & Melo, 2021). Therefore, scholars and educators need to decenter individualist responsibility and urge collective transformation of ways of knowing and being that allow oppression to persist (Jones & Melo, 2021).

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