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Postcards and Photo Walks: Telling Community Data Stories Through Photography

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Abstract: Representations of the health and resources of neighborhoods, particularly those made without a community's input, can be misleading, and can perpetuate inequities. We designed and implemented a two-week-long grade 8 unit to explore how photo walks—an arts-based methodology that involves capturing and reflecting on photos along one's walking route—can engage students critically with community data. We draw on a critical data literacy perspective, which views data as situated in social contexts and challenges the notion of data as neutral. Artifact analysis and post-unit interviews with two students revealed opportunities and challenges in supporting critical data literacy through planning and participating in photo walks.

Introduction

How communities are represented is a social and ethical challenge. It is also one that cuts across both data science and the arts (D'Ignazio & Klein, 2020). While a visual artwork, such as a photograph, can tell a story about people and places, it can also be used to overgeneralize. On the other hand, quantitative data can be challenging to collect and may overrepresent a community's problems (e.g., crime rates). In this study, researchers and teachers co-designed an 8th-grade, arts-integrated data literacy unit to engage students critically with community data through photography. In our design and analysis of student work, we draw on Philip and colleagues' (2013) framework for learning about big data for democratic participation, which outlines five goals: participating in the language and tools of data science, identifying as people who can use data for purposes that interest them, engaging in a process of inquiry to understand and address social issues, recognizing how data highlights and obscures perspectives, and making sense of and communicating data using the tools of multiple disciplines. To scaffold critical engagement, we draw on methods in photography that have a history of foregrounding discussions about representation and cultural narratives. Photovoice, for example, engages those who are often excluded from producing and analyzing data in creating bottom-up change through storytelling (Wang & Burris, 1997). Photo-walking, a collaborative activity that engages people in multisensory observations of their environments, further highlights how prior knowledge and experience affects data collection (Mainsah & Boe, 2019). This study builds on prior research in data literacy education that has sought to engage students critically with their communities through data (Rubel et al., 2016; Wilkerson & Laina, 2017; Kahn 2020; Stornaiuolo 2020). By comparing and contrasting the experiences of two students, we investigate *how planning and participating in photo walks prompted students to engage critically with data about their neighborhoods*.

Methods: Context, participants, and data

We co-designed and implemented a grade 8 unit called *Postcards and Photo Walks* with two teachers, one art teacher and one ELA/math teacher. Both taught at a private school in the U.S., in which the administration encouraged multidisciplinary connections between subjects. The art teacher wanted students to create an art piece that would generate pride in their neighborhoods and in their artistic abilities and that showed them real-world applications of art. The math/ELA teacher wanted students to be able to connect math to the real world. Through weekly co-design meetings over 6 months, teachers met with three researchers to identify the unit's focus on "healthy places," activities, and learning goals. We aimed to engage students critically with data through the following activities: reflecting on multiple ways to measure the health of a neighborhood, investigating community assets and issues through personal and public data, and drawing on the arts to connect personal experiences to community statistics. In this 9-day unit, students were asked to think about the question "What is a healthy place?" through photo-walking, and construct digital postcards that introduced their neighborhood to students living across the country. Due to pandemic-related restrictions in 2021, all students joined class meetings via Zoom, although some students were co-located in a classroom, while others were at home. Students contributed to class discussions and group work out loud as well as via the Zoom chat. On Day 1 and 2, students were introduced to the topic of healthy places by exploring data and engaging with a grounding artwork by the Anti-Eviction Mapping Project collective, titled *The Oakland Community*

Power Map (AEMP, 2016). The participatory mapping installation first appeared in the Betti Ono Gallery and was subsequently transformed into a digital map to enable crowd-sourcing. The purpose was to enable residents of Oakland, CA, to resist displacement through gentrification by letting “the city know what we have, what we value, and what we want” (AEMP, 2016; p.17). We engaged students with the main prompt of the artwork, to describe and map places that have “influenced or sustained you physically, emotionally, spiritually?” (AEMP, 2016). On Day 3, students read about access to healthy foods and parks and created scatter plots using CODAP (Common Online Data Analysis Platform). On Days 4-7, they participated in a photo walk, discussed their photos in small groups, and selected a photo to represent their series. On Days 8-9, students wrote letters about their neighborhoods and participated in a voluntary salon-like exhibition, reading their letters aloud to their class peers and invited guests (project researchers and advisors). Students’ artworks were collected into a class website by the research team to enable reflection across data and a way to share their work with friends and family.

Participants were 23 eighth graders from a private Catholic middle school located in a large urban area with a predominantly Latinx and Black or African American population (85%). About 70% of students are on a free or reduced price lunch program. Our data consist of (1) 45-minute, semi-structured interviews with two female students (whom we name Asami and Katara), in which we asked each student to reflect on their experiences during the unit; (2) two hour-long post-implementation interviews with each teacher, in which we asked them to reflect on how the unit met or failed to meet their learning goals, and on notable observations of student learning; (3) artifacts produced by the 2 students interviewed (letters, photography, maps, graphs, artist statements, and contributions to class discussions written in the Zoom chat); and (4) field notes from observations conducted over Zoom of 5 class sessions. Using a case study approach (Yin, 2009), we analyzed Asami and Katara’s contrasting experiences working with data through a process of planning and participating in photo walks.

Findings

Both Asami and Katara produced and used data for personally meaningful purposes, recognized data as useful for understanding and addressing social issues, and drew on the tools of math and art to understand and represent data (Philip et al., 2013). *The Oakland Power Map*, a grounding artifact for critical data literacy, prompted discussion about who is able to produce data to address social issues and why it matters. According to the art teacher, the purpose of the artwork “clicked right away,” with many students, who shared that “their neighborhood is [also] considered dangerous but that when you get there it’s a beautiful place, with beautiful neighbors.” Katara and Asami subsequently produced data about both community resources and problems, challenging single stories about their neighborhood. Their written letters also supported the importance of identifying more than just community problems. Katara wanted to “touch on stereotypes, specifically in [her county] because it has a reputation of being like a bad ghettoish community, but if you live there you’d see ...it’s more like a kind of family...” Asami wanted to write something that was “very honest but also relatable to people like me who live in [my community].” Next, we explore how Katara and Asami integrated art and math to support these personally meaningful purposes.

Case 1: Photographing frequency and variability of sidewalk cracks

Figure 1

Katara’s neighborhood walk (left), photographs of sidewalk cracks (right), and artist statement (bottom).



For this project, I chose to indicate life expectancy in my community with the quality of our sidewalks. Since sidewalks are used quite often, it is important to take care of them and make sure they function without issue. People that use walking aids, such as canes and scooters, have to watch sidewalks more carefully in case of cracks that can cause them to fall. In my community, cracks in sidewalks are quite common; it's easy to trip if you aren't paying attention. Although it is a small detail, having nice sidewalks improves a place's appearance while keeping its members happy and healthy.

Planning photo walks: Recognizing data as useful for understanding social issues

All students engaged in multiple planning activities to inform their photo walks. First, they drew maps of their neighborhood and explained their choices. Katara, for example, wanted to represent her own experiences *and* the diversity of neighborhood resources. She identified places in her neighborhood that she regularly went to and that

contributed to the health of her community (e.g., movie theater, grocery store, and park). She connected each place to different variables (e.g., population size, access to outdoor spaces, and affordable groceries) and thought critically about measurement. For example, she argued that “people [in her community] have options for what food to buy and consume” not only because a grocery store is geographically accessible but also because it offers quality food (e.g., “it tastes nice) and affordable prices (e.g., “lots of stuff up for sale”). Using her map, she then argued that her neighborhood was healthy because of the quantity of services available to meet public needs.

Next, students explored public data about their neighborhood to inform the subject of their photo walks. They made scatter plots to investigate variables such as average life expectancy and high-school graduation rates. Some students like Katara also proposed variables that were not represented in the data, graphing the change they wanted to see. Clean streets, for example, was a topic that Katara felt was “unique, that not a lot of people would think about...smaller things that would not really be thought of when you're looking at a map of a community.” She reasoned that “cleanliness correlates to life expectancy because if there's a place with a lot of trash that means it's not really well kept by sanitation workers and it can grow mold and bacteria and be like a farming point for diseases which isn't healthy.” According to Katara, analyzing data informed her photography by giving her “a general understanding of what to expect or what not to expect; it's like a hypothesis of the project.”

Participating in photo walks: Drawing on the arts to understand and represent data

During her photo walk, Katara's hypothesis was challenged by a lack of evidence. “I had trouble at first trying to see what I could take photos of...” she explained. But the lack of observable evidence of litter prompted her to shift perspectives, to engage in deep noticing, and to argue for the relevance of a different “small,” overlooked issue. Sidewalk cracks, she explained, were problematic in her community because “sidewalks are used quite often” and people with disabilities are especially vulnerable to tripping (e.g., “if you're using a wheelchair or some kind of walking device, sidewalk cracks can be dangerous”). To support her claim, she generated data on sidewalk cracks by photographing the frequency and variation of cracks around her home. Using a consistent point of view, repeated sampling, and organization of images, she summarized this problem as a pattern rather than a point (see Figure 2). Each image showed variation in the number, size, shape, and location of cracks. Her focus on texture further highlighted the age, material, and quality of sidewalks. As a result, her photo series engages the audience in more than counting cracks. By mapping different areas in her neighborhood, explaining where she collected data, and visualizing variation in cracks, she enables informal inference-making about her neighborhood.

Case 2: Photographing neighborhood contrasts

Figure 3

Asami's photo series of contrasts (left), and artist statement (right).



Planning photo walks: Recognizing data as useful for understanding social issues

Asami's map highlighted *her* “tight community,” which included a church, nearby homes of family members, the train, and local delis. She chose to represent only the few blocks around her home, centering the everyday places and experiences that help keep *her* healthy and occupied (i.e., exercising, commuting to school, seeing family). While Asami also investigated public data about her city, interpreting interactive data visualizations and making scatter plots, she largely drew on personal experiences to inform the subject of her photo walk. At the same time, analyzing neighborhood data confirmed her understanding that crime was a problem in her neighborhood and helped her identify significant consequences (e.g., lower average life expectancy). During class discussion, for example, she argued that average life expectancy was a good way to measure the health of a place because “you live longer when you live in a healthier environment. The area you live around affects how you feel. The cleaner areas in my data have a longer life expectancy than others. [My community] had 4 points below the life expectancy of [other areas].”

Participating in photo walks: Drawing on the arts to understand and represent data

In her photo walk, Asami contrasted her neighborhood with a nearby industrial area known to be dangerous. The first two images show her everyday walk to the train and nearby businesses, while the second shows a neighborhood, a few train stops away, that she avoids due to a dangerous underground club. Her goal was to represent her community as a whole, showing positive and negative characteristics (see Figure 2):

I went around the block looking for places that had some litter in it or have a bit nicer, more vibrant colour...there are nice stores, you have the train station, but you have this litter and then there's of course danger in the area, so having those contrasting things shows how the community really is as a whole.

Contrast is a theme in her artist statement and letter, and also emerges in how she talks about community action and health. She recognizes that there are decisions and resources that individuals cannot control but also opportunities for action, “work[ing] together...not throwing stuff on the ground, adding more trash cans, decreasing crime rates.”

Discussion and Significance

Planning and participating in photo walks prompted students to engage with social issues through a process of inquiry (Philip et al., 2013). In planning their photo walks, Katara argued that her community was healthy based on the number and variety of available services on her map, connecting places to variables such as population size and access to parks. Asami argued for using average life expectancy as a measure of health, drawing on neighborhood data and personal experiences as evidence. When confronted with a lack of evidence, Katara identified evidence of an alternative topic and Asami recognized and attempted to explain a sampling problem (i.e., time of day). In their photo walks, both students demonstrated attention to informal inference-making (Makar & Rubin, 2018), visually summarizing data as a pattern or comparison and discussing context. These findings highlight future opportunities to reinforce statistical concepts, such as sampling and variation, by iterating on data analysis and photo walks.

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