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The World in Your Pocket: Digital Media as Invitations for Transdisciplinary Inquiry in Mathematics Classrooms

Lynette DeAun Guzmán and Jeffrey Craig

How might mathematics education serve students who are digital natives and who are constantly connected to global and local issues? When all students have access to live streams of social justice movements and trending pages updated every time there is breaking news of a mass shooting or a natural disaster across the world, what should a mathematics classroom look like? How should mathematics classrooms respond? As mathematics educators, we have thought about our own teaching practices in order to address these questions (Craig, 2017; Craig & Guzmán, 2018; Guzmán, 2017).

In 2016, an estimated 3.17 billion people had access to the internet, with the top three internet-accessible countries being China (730.7 million), India (374.3 million), and the United States (246.8 million).[1] American society constantly consumes digital media infused with quantitative and visual rhetoric—and so we have numerous opportunities to engage critical mathematical inquiry (Craig, 2017; Mehta & Guzmán, 2018). Like many educators, we have considered the affordances and constraints of using digital media in our classrooms. These considerations have informed a teaching philosophy centered on the idea that we can build and engage a curriculum from our pockets using smartphones connected to the internet and social media.[2] We draw upon our students' lived experiences and local communities, but we recognize that social media and the internet can localize the world, too, as global issues transmit to the phones in our pockets.

Digital media and constantly evolving digital technologies are becoming more integrated into social interactions, blurring boundaries between media and lifeworld[3] (Mitchell, Simmons, Matsa, & Silver, 2018). This integration underscores an important potential role for digital media in K-16 education. As digital media literacies become more intertwined with cultural knowledges and practices, mathematics educators might consider how multimodal sensemaking of digital media might be relevant to their classroom contexts. Because internet-based "information is more widely available from people who have strong political, economic, religious, or ideological stances that profoundly influence the nature of the information they present to others" (Leu, Kinzer, Coiro, Castek, & Henry, 2013, p. 1161), the rapid pace of production of a wealth of online digital media requires us to take a critical stance toward this information.

Not only is the amount of, and access to, quantitative information affected by democratized access to the internet, the nature of quantitative representations has also changed. The pervasive creation and use of digital media in the United States provides an increasing number of encounters with *information graphics*, or *infographics* (Lankow, Ritchie, & Crooks, 2012). An infographic communicates information through visual signals in a quick and accessible manner (Tufte, 2001). Although infographics existed prior to

1 *The World Factbook* (CIA): https://www.cia.gov/library/publications/the-world-factbook/index.html.
2 Guzmán (2018) discusses examples of "reading and writing the world" through your pocket in a YouTube vlog: https://youtu.be/afcDtwrBNhA.
3 Merriam-Webster Dictionary defines "lifeworld" as "the sum total of physical surroundings and everyday experiences that make up an individual's world."

widespread internet use (Pasternack & Utt, 1990), the internet has increased their relevance by facilitating their creation and sharing. Building a curriculum from online digital media may provide opportunities for students to draw on related experiences across their lives, deconstruct dominant narratives, and engage with complex multimodal artifacts through transdisciplinary inquiry.

Theoretical Perspectives

This article focuses on an example of how we have both used a digital infographic, *The World as 100 People*, to engage students' funds of knowledge to unpack global and local issues in mathematics classrooms. Both of us teach undergraduate courses of primarily freshmen and sophomore students, but in different settings. Lynette teaches a mathematics content course for future elementary educators who are often positioned in research-based recommendations as not liking or having strength in mathematics (e.g., Conference Board of the Mathematical Sciences, 2012; National Research Council, 2001). Jeffrey teaches quantitative literacy courses that he co-developed with his colleagues as new introductory mathematics courses that count toward the university's mathematics requirement. These quantitative literacy courses focus on mathematical and statistical tools—such as arithmetic, quantitative data, and modeling—as applied to everyday life. Quantitative literacy itself, however, involves a set of social practices that are mediated by quantities, such as "[taking] out a second mortgage, [voicing] a perspective on a new economic policy, or… [inquiring] about the absence of quantitative information" (Craig & Guzmán, 2018, p. 9). Students placed in these courses have often been labelled as "unsuccessful" at college-level mathematics.

Funds of Knowledge

We view mathematics learning in terms of participation (Lave & Wenger, 1991) in the practices and discourses involved in *mathematical experiences*. In previous work (Craig & Guzmán, 2018; Guzmán, 2017), we considered mathematical experiences as people engaging with quantification, patterns, or spatial reasoning. Mathematical experiences are, therefore, not limited to what happens in mathematics classrooms; rather, mathematical experiences happen frequently, in many spaces, alongside and intertwined with other types of experiences. By broadening what constitutes mathematical experiences, we widen what counts as engagement with mathematics to legitimize multiple knowledges and practices in mathematics education.

Mathematical knowledge is fundamentally linked to cultural practices (Nasir, Hand, & Taylor, 2008). Research calls for incorporating students' home and community-based mathematical *funds of knowledge* to support student learning (Aguirre, Turner, Bartell, Kalinec-Craig, Foote, Roth McDuffie, & Drake, 2012). Originally coined by Vélez-Ibáñez (1988), funds of knowledge refers to an array of historical and cultural knowledge and skills, which are often "essential for household or individual functioning and well-being" (Moll, Amanti, Neff, & Gonzalez, 1992, p. 133). When teachers consider students' funds of knowledge, they are taking an assets-based perspective, allowing students greater opportunity to engage in lessons that honor and incorporate their knowledge and experiences (Aguirre et al., 2012).

Deconstructing Dominant Narratives

Chubbuck (2010) suggests that "socially just teachers recognize the need to look beyond the school context and transform any structures that perpetuate injustice at the societal level, as well" (p. 198). Social justice education work involves the development of critical consciousness (Freire, 1974) by interrogating systems of power, privilege, and oppression. Students engage in this work as they question, challenge, and critique structural inequities (Young, 2010).

Engaging in critical mathematical inquiry involves interrogating and deconstructing the dominant narratives that shape the lens through which we see and experience the world. We draw on Gutiérrez's (2012) critical axis for framing equity in mathematics education—which centers on dimensions of identity and power—to identify and make sense of the dominant narratives. We view narratives as dynamic, shared storylines of circulated discourses, which are "continually taken up, reproduced, and resisted in multiple ways in daily life" (Nasir & Shah, 2011, p. 26).

For mathematics education, these narratives are stories that are told about students, about teachers, and about mathematics. Commonly recirculated discourses within mathematics education construct dominant narratives about what counts as mathematics and who can do mathematics. This includes (but is not limited to) racialized narratives (e.g., Larnell, 2016), gendered narratives (Leyva, 2017), and disciplinary narratives. For example, narratives about mathematics often emphasize that it is about solving equations and providing solutions that are either right or wrong. Stories about being a "math person" (or not) suggest that mathematics belongs only to certain people. These examples are recognizable narratives that are well-entrenched in schools (and, of course, our broader society) and that constrain what is possible for mathematics education. Some students are marginalized by traditional practices in mathematics classrooms. Engaging with digital media, however, provides potential for blurring the boundaries of an increasingly connected world.

Transdisciplinary Inquiry

In contrast to the strict disciplinary boundaries of many schooling contexts, we conceptualize schooling in the digital age to be better suited to *transdisciplinary* approaches that "step outside the limiting frames and methods of phenomenon-specific disciplines" (Davis, 2008, p. 55). A transdisciplinary approach values the multiplicity of knowledge from different disciplines and their fusions (Lawrence, 2010). Transdisciplinarity, then, can redraw the boundaries of inquiry around specific contexts or problems—for instance, by asking what disciplines and their fusions can contribute to addressing and resolving a problem, rather than whether a problem belongs inside a discipline. Transdisciplinarity "is created by including the personal, the local, and the strategic, as well as specialized contributions to knowledge" (Brown, Harris, & Russell, 2010, p. 4). In other words, all knowledge is relevant and applicable to resolving the problems.

These three ideas—funds of knowledge, dominant narratives, and transdisciplinary inquiry—can coalesce to organize schooling experiences in new ways. The next section focuses on our experiences engaging

with these ideas in our mathematics classrooms. We share an example of using an infographic, coupled with undirected and multidirectional inquiry, to support a transdisciplinary educational experience.

The World as 100 People

Jack Hagley, an infographic designer from London, created *The World as 100 People* infographic[4] based on global data from a collection of sources. In this graphic, Hagley scaled quantities from a world population of over 7 billion people down to 100 people for each of 14 categories. For example, population by continent for a world of 100 people would include 60 people living in Asia, 15 people living in Africa, 11 people living in Europe, 9 people living in South America, and 5 people living in North America. Other examples of categories on this infographic (see Figure 1) include religion (Buddhist, Christian, Hindu, Muslim, other, no religion); internet (can access the internet, cannot); nutrition (overweight, adequate, undernourished, starving); and housing (have a place to shelter, have no shelter).

Figure 1. The World as 100 People infographic by Jack Hagley.

Teaching Contexts

Although we have different teaching contexts and students, we have collaborated in developing, revising, and debriefing the activities we describe in this paper. We share selected examples from one semester of Jeffrey's quantitative literacy course as the research context. Both authors analyzed student work in iterative stages, involving individual analysis followed by co-analysis to revise for more nuanced

4 See http://www.jackhagley.com/The-World-as-100-People for full resolution of infographic (Figure 1).

interpretations. During this process, we discussed common themes in student discourses, both in terms of their mathematical sensemaking and the narratives they made connections to.

Learning Goals

Students were expected to explore, interrogate, and make sense of quantities within real-world contexts. They were asked to consider how their preconceptions of the world might be inaccurate and explore why this discrepancy may exist (e.g., media discourses, commonly recirculated narratives). We expected students to draw on mathematical ideas such as proportional reasoning, relative error, and conditional probabilities at least informally in making sense of statistical data. Finally, students were expected to engage in *Common Core Standard for Mathematical Practice 4: Model with Mathematics* (Common Core State Standards Initiative, 2010), in their sensemaking. Not only did we intend for students to analyze, interpret, and critique quantitative information, but we had goals for centering philosophical explorations about what quantification means within complex global contexts.

There are likely other mathematical connections that students might explore. In our discussion, we encourage educators to creatively use their professional skills and expertise to make other connections to mathematical (and non-mathematical) ideas as they see fit.

Prediction Task

We began with a prediction task where we imagined our world population shrunk down proportionally to a village of 100 people. What would our village look like? The facilitation of this task may be adapted to fit different classroom contexts. For example, students could be asked to fill out a survey before class for all the categories depicted in the infographic, or to choose a few categories to fill out at the beginning of class. They should be asked to keep the following in mind:

- Carry this out as an individual activity
- Draw on your knowledge and lived experiences
- Do not look up data
- It is not about being "right"

We avoided positioning students as the targets of jokes about their ignorance. Instead, we made discursive moves in the form of *sympathetic pain*, which Grawe (2015) proposed as an alternative way to talk about ignorance. Explicitly stating that this predictive task was not about being "right" or "precise"[5] (unlike expectations in traditional mathematics classrooms), we recalled our own first encounters with the task—full of surprise, inaccuracies, and questions. We encouraged students to write down their initial predicted values and to make note of any questions about the ways we were defining particular labels for our later discussions.

5 This is in contrast to *Common Core Standard for Mathematical Practice 6:* Attend to precision.

Data Revelations Through a Kinesthetic Task

After the prediction task, we structured the data reveal using physical space. The purpose of this task was to demonstrate common perceptions about the world in our classroom community. We used a nearby hallway space as a scale with label markers from 0 to 100. Students took their predictions with them as we called out various categories to model. If the world were 100 people:

- How many would have cell phones?
- How many would be able to read and write?
- How many would be Christian? Muslim?
- How many would live in Africa? Asia?
- How many would speak a first language other than Arabic, Bengali, Chinese, English, Hindi, Japanese, Portuguese, Russian, or Spanish?

Using physical space allows for a spatial arrangement of each person's individual prediction. When the whole class participates, there are visual cues for clusters of students (indicating similar guesses) and an embodied distribution for the range of values predicted across the entire group. After students position themselves along the scale and can see what other students have predicted, the teacher reads out the reported data from the infographic. Then, students may write a brief reflection about the prediction task and movement exercise to identify what surprised them the most and least.

What Do We See, Think, and Wonder?

Teachers might provide a graphic organizer for students to document their reflections about what they see, think, and wonder. This activity can be completed online as well through platforms such as Padlet (www.padlet.com) or a classroom-shared Google doc. An advantage of using digital platforms is that students can add attachments, insert images and hyperlinks for multimodal engagement, and comment on each other's work.

What do we see… reflects on what students notice about the infographic. Typically, it involves minimal interpretation and centers observation in various areas, such as:

- Individual categories (e.g., religion) or labels (e.g., male and female for gender)
- Quantities in the infographic and/or in our predictions
- Provided definitions[6] and/or data sources

6 Selected definitions for categories in *The World as 100 People* may be found at http://www.100people.org/statistics_detailed_statistics.php.

What do we think… builds on initial thoughts and unpacks these observations. Students use interpretation to make sense of information displayed, often with supporting evidence from their lived experiences and funds of knowledge. Guiding questions might include:

- What do you find most surprising, and *why* is this surprising to you?
- Which of your predictions were accurate (or not), and *why*?
- How do you make sense of the information and documents?

What do we wonder… extends beyond the specific media artifact. Students identify broader thoughts and questions for further application or analysis (e.g., zooming in on world wealth distribution[7]). For instance:

- What are you still wondering about related to global issues? *Why* does this matter to you?
- Why might someone create this image? What stories might we tell about this media?

Extension: *100 Person Country Project*

In our classes, we extended *The World as 100 People* by having students complete an assignment that recreated the infographic for a specific country of their choice. This research assignment was done primarily in class, using the phones in students' pockets or laptops on their desks, with students searching for data sources, sharing what they found, and verifying the validity of the numbers they had discovered.

At home, students completed their own infographics, formatted similarly to the worldwide infographic, and returned to class ready to share. In groups of five, students passed around their 100-person country infographics (see example in Figure 2), viewing each one for two to three minutes and recording their observations (e.g., similarities and differences compared to the world or to other countries). After two passes, we held a brief discussion about the strategies students were using to make sense of each infographic.

7 See Global Wealth Inequality: https://youtu.be/uWSxzjyMNpU and Wealth Inequality in America: https://youtu.be/QPKKQnijnsM. Lynette used these videos in an adaptation of a lesson by Hersh & Peterson (2013).

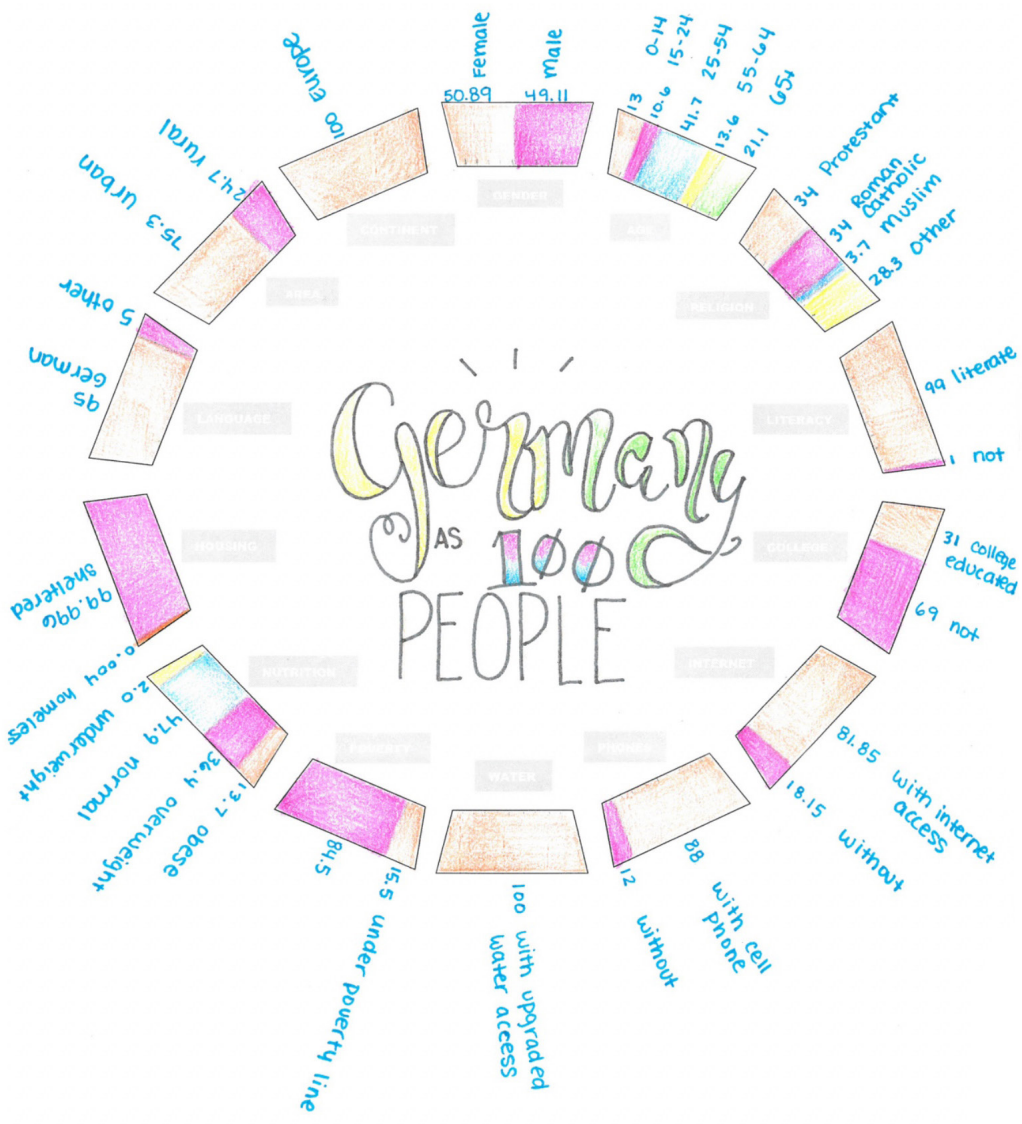

Figure 2. Student work for infographic of Germany as 100 People.

Once all five passes were complete, students debriefed their findings, noting:

- Any patterns they noticed across the infographics
- Questions that came up for specific country data
- General reactions to specific country data (e.g., any categories that were surprising)
- Possible connections between categories

In closing, teachers might facilitate a discussion about how perceptions are related to sampling issues. For instance, our news media presents perceptions of the world from a United States perspective tied to American societal values and expectations. Additionally, news segments often highlight events that are outliers (rather than normalized), which might link to dominant narratives that are circulated about particular groups of people or regions of the world.

Leveraging Students' Funds of Knowledge with *The World as 100 People*

When we embraced critical mathematical inquiry in our classrooms, we found that our activities, practices, and content necessarily involved more than just mathematics, which was helpful for leveraging students' funds of knowledge. In particular, we needed to draw attention to how students were invoking multiple kinds of narratives to connect local and global contexts. Drawing broadly on critical perspectives, we explored epistemological and ethical questions. For instance, if in a world of 100 people only five people speak English as their first language, why is there such an interest in teaching students to speak English (particularly in the United States)?

Opening up our critical mathematical inquiry, we wondered how our students were negotiating their particular and personal knowledge and experiences with the global data presented to them in this infographic. Students were seen to engage with this complexity in multiple ways—by considering possible intersections or relationships between categories and by investigating definitions to determine what data is counted and how it is organized. For example, regarding how many people in our 100-person world would have cell phones, one student commented, "Everybody's got phones." Moments later another student responded, "...in America." Students had opportunities to use their experiences (e.g., living in a place where it seems that every person has a phone) as a reference point while also recognizing the limitations of their own experiences (e.g., pointing out that we live in the United States and cannot speak for the whole world).

Unpacking Dominant Narratives in Students' Sensemaking

The World as 100 People infographic demonstrates how important narratives about the world can be constructed and shared. Considerations include thinking about how data collected in different countries can be aggregated and how variables like poverty and literacy are defined. Part of our facilitation role is to bring out the complexity in this seemingly simplified infographic product:

- How/why was it made?
- Where did this information come from?
- What do our reactions reveal about our values and assumptions?

A major component of our small-group and whole-group debriefing involves grappling with our ignorance about the world. What happens when drawing on students' funds of knowledge brings out

dominant narratives that are stereotypical or even wrong? Single stories (Adichie, 2009) that portray groups of people or regions of the world in essentializing ways can flatten the complexities of diverse human experiences.

For example, Maria wrote in her reflection of the 100-person country extension, "Mainly I paid attention to education levels, religion, and quality of life like internet and cell phone access. I was surprised that 89 percent of people in Cuba do not have access to cell phones." Although Maria described "quality of life" as access to the internet and cell phones, she did not explain why it was surprising that 89 out of 100 people in Cuba did not have access to cell phones.

It is possible that Maria's surprise might be connected to the kinds of stories that are shared about Cuba or the kinds of stories shared about quality of life. In the future, we might address this type of response by having students revisit their words from this assignment to further articulate why they were surprised by the data with a specific prompt to identify specific knowledge and experiences that may seem to contradict what is represented in the data. Alternatively, we might bring up an example that several students noted in their reflections to discuss in small groups to tease out reasons why the data might be surprising to some people. Keeping in mind that we do not want to position students as targets of jokes or embarrassment, we might address this situation differently with different groups of students.

There were also moments where students felt compelled to explain their sensemaking, often by leveraging their previous knowledge and understandings of historical contexts. Beth, for example, wrote about a large percentage of Roman Catholic people in Costa Rica (76 percent), "but in South America I guess that makes sense when people first came over and converted everyone." Drawing on her understanding about Spanish colonization of the Americas, Beth placed a historical context onto making sense of the data.

In Beth's initial reflections about *The World as 100 People*, she noted being surprised that there were more Christians (33) than Muslims (22):

> The way Christianity is portrayed in pop culture and publicly typically tends to put them in a poor light. I'm surprised that the number wasn't lower… I was equally surprised the number of Muslims was lower than Christians. It seems like the media in most countries immediately zero in on people who practice this religion and claim that the number is growing within their ranks and that people should be afraid. They make it seem like there are more than there are. So, the numbers were surprising to me.

Beth pointed out a fear-based dominant narrative where "[media outlets] make it seem like there are more [Muslims] than there are." She drew on critical data interpretation to question this dominant narrative, which falsely portrays Muslim people as a growing threat. A dominant single story that suggests "people should be afraid" of a growing number of Muslim people is an example of essentializing, which flattens the diversity of experiences and perspectives within this group of over 1 billion people.

Similarly, Terrell pointed to media discourses as contributing to his perception and sensemaking. Reacting to a classmate's comment on Cuba, Terrell wrote:

> Amazing to think that nearly 90 percent don't have access to cell phones... I know it sounds bad, but I expected the poverty rate [85 not in extreme poverty, 15 in extreme poverty] to be higher based on some of the things I've heard in the media about the country being so poor.

This example demonstrates that students are often aware of dominant narratives, and Terrell explicitly admitted, "I know it sounds bad" in his reflection. If a single story about Cuba in news media is heavily centered on high poverty, then it can be surprising to see data that 85 out of 100 people in Cuba are *not* in extreme poverty. We can further examine, however, different definitions for what counts as poverty (or in this case, "extreme poverty").

Students also considered relationships between having a college education and other categories (e.g., literacy, internet, cell phones). In Matt's written reflection on 100-person countries, he commented that Denmark "seems like it is a very educated country which seems to correlate with the amount of clean water, low poverty, housing, etc." He also said he was surprised that in South Korea "only 61 percent go to college or have degrees given that S. Korea has such a high value on education." While a discussion point might involve unpacking the specific claim that, culturally, people in South Korea value education, an implicit assertion in this statement might be that countries with a low percentage of people with college degrees do not value education. These are complex discourses worth further interrogation because there is a potentially dangerous single story that could essentialize people in South Korea. In other words, a complexity of diverse perspectives and experiences that people in South Korea might have about education can be minimized and erased.

Discussion and Possibilities

In this piece, we have shared our experiences as mathematics educators using a digital infographic in our classrooms to support critical mathematical inquiry. We navigated hesitations and conflicts in drawing on students' existing knowledge about people and locations in the world that were simultaneously problematic and rich with opportunities for critical inquiry. In particular, we want to reiterate that these students, who have often been typecast as less capable of engaging with rich mathematical ideas, were exploring complex, global contexts. They drew on both mathematical and non-mathematical knowledge in their transdisciplinary inquiry.

With an increasingly connected world, digital media is constantly produced, recirculated, and remixed through multimodal platforms. Greater access to information supports a focus on critical literacy in schools. Critical literacy, as a social practice, can contribute to emancipatory participation in the contemporary world (e.g., Freire, 1970). Specifically, critical literacy can be used as a tool in the emancipation of oppressed people or to reconstruct existing social power structures (Giroux, 1984). We focus on critical literacy in this piece as an approach for emancipatory practices, although there are certainly other approaches educators might explore.

What we hope to offer is that our experiences using *The World as 100 People* pushed back on (1) the way mathematics should be formally taught in schools and (2) common practices around social media restrictions in schools. Rather than being a distraction, our students engaged in powerful and interesting critical mathematical inquiry by examining artifacts produced online. And rather than solely privileging mathematical content, students were able to explore transdisciplinary inquiry through these digital media invitations.

What we appreciated from our experiences using *The World as 100 People* is that this infographic is a simplified product of a complex world and provided ample opportunities for students to explore in depth (e.g., how and why it was created, where the information came from). These explorations allow us to examine complex models and data through critical lenses. For example, we could explore the politics of creating metrics and counting (Andersson & Wagner, 2018) framed by the question, "How do we decide what to count and what not to count to produce these data?"

What Stories Do We Choose to Tell With/out Mathematics?

A key point of this lesson was to interrogate what stories we know, about whom, and why. Do we only know single stories about particular groups of people and categories?

As educators, our goal is not to make people feel bad for not knowing mathematics (or the entirety of global data). We cannot individually know everything about the world; that is not reasonable to expect from students. What we can do, though, is provide space for students to interrogate why we have specific perceptions about the world and acknowledge the dominant stories that we (re)circulate. Collectively, we know a lot of things that a single person alone might not; however, discourses shape perceptions that might be flawed.

Hesitations and Conflicts

As millennial educators, we both grew up with the internet; however, the ways social media and our collective digital literacies have evolved pose challenges for a constantly connected world. This spring, for instance, I (Lynette) had strong reservations about exploring *The World as 100 People* with my students. I wondered about my contribution to a spotlight on global (and local) issues and how my students might be affected by this intense focus. When tragedies such as mass shootings seem to occur with disturbing regularity, I personally have experienced a paralyzing existential crisis: Does mathematics education actually matter in the face of tragedies, terror, hate, pain, and destruction? This reflection is often complicated by being a woman of color who is exhausted from fighting to exist and thrive in an imperialist white supremacist capitalist patriarchy (hooks, 2004). I do, however, also feel a responsibility to provide space for my students to process, grieve, heal, and not be afraid to speak about atrocities in our world.

For me, Jeffrey, the challenge of *The World as 100 People* and its illustration of the world in our pocket is how strongly it conflicts with the current organization of schooling. My perspective is that schools are built around the idea of isolation and self-containment. Students are expected to leave their problems at

home, or in other classrooms where they belong, or out in the hall. Teachers are expected to implement problems from mandated curricula that do not affect or intersect with home, or other classrooms, or the complex everyday lives of their students.

Most attempts to connect with students' lives or the world outside the classroom are oversimplifications, as though students are not ready to confront the actual problems of their lives and world (Freire, 1974). But students already have the world in their pockets; they bring their personal and the world's problems with them into the classroom only to see them ignored in favor of attempts at neutrality. Although I find the majority of mathematics curricula to be mundane, I am also concerned about bringing the world's problems into the classroom, precisely because students already engage with them constantly. A third option must be available, and perhaps it is classrooms being spaces of healing, where problems are posed and processed with patience and care. This seems reasonable, as classrooms are face-to-face spaces that can offer something not available in digital spaces.

A current question that guides our teaching involves continually asking ourselves, "Is this worth our time and energy right now?" This question forces us to make visible our value judgments for what contexts we connect to mathematical ideas and practices. It makes us focus on temporal and historical contexts, often centering the psychological and emotional needs of our students and their histories. And finally, it offers educators a frame to choose how we might engage our creative energies and connect mathematics to other subject areas or social, political, and historical contexts in our work.

Critics of our work might ask us to defend why these activities belong in a mathematics classroom, or suggest that rich critical inquiry is in tension with requirements that mathematics educators are pressured to follow. If content coverage is a concern, we suggest supplementing critical mathematical inquiry with other types of activities that serve students' needs. Overall, this process is a continual negotiation of multiple goals for mathematics classrooms. Bartell (2013), for example, outlines how teachers balanced mathematical goals with social justice goals as they implemented and revised lessons focused on teaching mathematics for social justice. If time is a concern, we suggest making small changes in curriculum materials or bringing in an activity from an existing resource, such as *Rethinking Mathematics* (Gutstein & Peterson, 2013). Teaching critical mathematics is a long-term project that requires much time and revision, as some mathematics educators have pointed out (e.g., Gutstein, 2012; Wamsted, 2012).

As educators, we make decisions about what we value in our classrooms. In doing so, we engage questions about mathematics education itself. Do we value specific content standards or should we focus on other things? One area of growth that we see for mathematics education involves making sense of quantitative information through online media spaces. More specifically, we are interested in how people critically examine and respond to information regarding the intersections of mathematics and social issues. Infographics, as prevalent visual representations of data in media, fit these interests. At the same time, we cannot solve global issues with mathematics alone. In our continued work, we hope to open up more spaces in our mathematics classrooms for transdisciplinary inquiry where students articulate difficult

problems and are open to explore the messiness of working with more than "just" mathematics (Craig, Guzman, & Krause, 2018).

Finally, we close with more questions than definitive answers. We are mathematics educators who are writing, teaching, and creating work that is not solely mathematics. We are fully aware of the elephant in the room: "Where's the mathematics?" But the reason we gravitate toward transdisciplinary inquiry is because of the challenges and limitations we have faced as educators who have been pressured to focus only on mathematical content in our classrooms.

As multidimensional human beings who engage practitioner-inquiry in our scholarship, we have found ample opportunities to question ourselves and the kind of work we do with critical mathematical inquiry. Our hope is that other mathematics educators join us to create new experiences, which might mean blurring disciplinary boundaries where mathematics comes in and out of focus. With each of us having the world in our pocket, there are endless possibilities.

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