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Including Students' Geographies in Geography Education: Spatial Narratives, Citizen Mapping, and Social Justice

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Abstract: Preparing students to become active, participatory citizens is more than promoting personal responsibility. It requires actively engaging with others in order to improve one's community. Using a critical geography approach, this article describes research with students living in urban areas that engaged them in fieldwork and citizen mapping of the neighborhood around their high school. We were interested in how they interacted with this environment and their perceptions of social justice issues in the community. Student groups worked together to identify and investigate topics of their choosing in order to produce and present their findings and recommendations to community stakeholders. We collected data from these students through case studies, sketch maps, and interviews, which revealed an increase in understanding of their neighborhood and an appreciation for the use of spatial thinking and technologies in addressing issues that they care about as citizens.

Keywords: citizen mapping, civic identity, critical geography, experiential learning, spatial narratives

Development of civic identity is relevant across all educational disciplines, but it is particularly significant in social studies education because it has been identified as a predictor of continued citizenship engagement into adulthood (Zaff, Malanchuk, & Eccles, 2008). Indeed, the purpose of social

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studies is to promote and develop active, participatory citizens (National Council for the Social Studies, 1994). Atkins and Hart (2003) extrapolated two common elements from definitions of civic identity: "a sense of connection to a community" and "entitlements and responsibilities" between the individual and their community (p. 156). This sense of civic identity and responsibility, however, varies among individuals based on age, culture, geographic contexts, socioeconomic status, and other factors, which has important implications for civic education.

Knowledge of and interaction within a neighborhood and/or local community are deemed important in the overall development of a sense of self (Kyle, Jun, & Absher, 2013), which supports civic identity. Citizenship develops in the context of places in and around schools, neighborhoods, and local communities, as well as through interactions with others. Kirshner, Strobel, and Fernandez (2003) suggested that it is crucial to understand how students think about the environments in which they live to "[support] their capacity to help build, shape or challenge the institutions in those settings" (p. 2). While the actions of building, shaping, and challenging are indicators of active citizens, students rarely have an opportunity to participate in activities in which they help to build, shape, or challenge issues. Mohan (1995) recommended that students should be engaged in studying local issues as active participants and contributors so that they might better understand the origins of social problems and realize how they can participate as citizens in finding solutions. Community-based teaching and learning offers opportunities for individuals to engage with real world problems and apply knowledge, skills, and technology in meaningful, productive ways (Bednarz et al., 2008).

Aligned with these conceptions of active and participatory citizenship that engender civic identity, our project included students' use of spatial thinking, geospatial technologies, and citizen mapping to enhance their knowledge of the community surrounding their school through experiential learning. Our research was conducted over the course of two summer workshops with students in grades 7–12 at Jesup W. Scott High School in Toledo, Ohio, known locally as Scott High School. In order to achieve our objectives, we applied a critical geography perspective and participatory approach, in which students worked in collaboration with us as researchers and instructors. While we provided a space and guidelines for learning about and addressing their concerns about the community, the students generated their own experiential learning topics, determined what they wanted to explore in the community, and identified what information they needed to help them answer their questions. We, then, provided guidance in constructing questions, using technology, conducting fieldwork, finding secondary data, making maps, interpreting their data, and presenting their results and recommendations to key community stakeholders. We started with what the students already knew about their community to support critical thinking and to encourage active participation in the learning process. To increase their engagement in geography education and

empower them as active citizens in the community, we sought to recognize and incorporate the students' geographies into the learning process.

To assess the effectiveness of our approach, we utilized the following supporting questions:

1. How did students describe the neighborhood surrounding their high school prior to and after the workshop?
2. What areas of the neighborhood were students familiar with, what areas did they avoid, and why?

In addressing these questions, we expected to unravel students' spatial narratives and to discover the ways in which students learn about their community by "doing" geography. We understood that students' pre-existing spatial narratives about the neighborhood shaped the experiential learning process and outcomes. Consequently, we propose a model for including students' geographies in geography education, which promotes critical thinking, expands students' spatial narratives, empowers them as citizens, and prepares them to think beyond the local scale.

LITERATURE REVIEW

The Value of "Doing" Geography Locally for Civics Education

It is where students live their everyday lives and have personal connections that they can be engaged in civic education and feel like they are making a real difference as citizens in their community. Aligning with Schmidt (2011), who argued that "citizenship is one sense of self attached to places and how we teach has implications for how students conceive of themselves as citizens" (p. 107), we advocate for active learning, where inquiry is student-led and learning is authentic, set in the places where students live their daily lives. Students learn concepts and skills in the context of familiar geographic spaces by "doing" geography. Shurmer-Smith (2002) explained that active learning has many forms, including "looking, feeling, thinking, playing, talking, writing, photographing, drawing, assembling, collecting, recording and filming as well as the more familiar reading and listening" (p. 4). "Doing" geography supports students' enthusiasm for learning geographic concepts and approaches, such as the value of spatial thinking and geospatial technologies in understanding and addressing community challenges.

While historians study phenomena over time, geographers examine them over space. In other words, they are spatial thinkers. Geographers ask questions about where things are located and why they are there. Further, they are interested in understanding the patterns and connections of points, lines, and areas across the Earth's surface. With a demand for an increase in scientific and technological literacy, there is a need for integrating spatial thinking,

perspectives, tools, and technologies into the K–12 curriculum (National Research Council, 2006). Spatial thinking is enhanced by "doing" geography in active rather than passive ways. Providing opportunities for students to be spatial thinkers at the local scale, where they are familiar with the surroundings, will prepare them to apply these skills to more complex regional, national, and global challenges.

There is a popular misconception that geography education focuses primarily on teaching students the locations and names of countries, states, and their capitals. However, geography is an interdisciplinary discipline with a long-standing tradition of using a holistic approach to understand human and environmental challenges. To address local issues and support teaching and learning in geography, educators are increasingly recognizing the value of including students' geographies (factors affecting their lives) in the curriculum.

In a study on geographic education in primary grades in Ireland, Pike (2011) suggested, "Across all research in the field, the most consistent finding in the research is that there is a value, including learning, in the use of the local environment" (p. 141). Pike was interested in discovering how 168 fifth and sixth grade students (ages 10–13) from both rural (47% of participants) and urban (53%) settings used their local environments and how these environments affected their learning. Beyond these objectives, she wanted to reveal what impacted students' experiences in the local environment, such as the built environment, inequalities, power structures, and the physical and social environments. For the students in her study, the social environment was the most important to them because these interactions contributed to a sense of belonging in the community more than interactions with the natural or built environments. One goal of the research was to explain how students' experiences and knowledge of the local community could be integrated into learning geography in formal and informal settings and to move students from being submissive to active citizens. Pike concluded that "the local environment opens up a wealth of opportunities for children's learning in geography and that this learning should be used beyond school for the benefits of local communities, but most of all for the children themselves" (p. 156).

Using the local environment as a platform for learning provides an opportunity to apply content and skills in a familiar setting. Indeed, our experiences in our local communities, where we engage directly with the physical and human environment, affect the way we perceive the world and our sense of belonging as citizens in these places. Geography education provides opportunities to expand our existing perceptions and to increase our understanding of the complexities of human–environmental interaction in unfamiliar places beyond the local.

Spatial Narratives and Mental Maps

Our study was designed to introduce students to new skills and concepts as well as to understand how they interact with and perceive the spaces in their

community. Spatial narratives (or stories) provide a means of "unpacking" these interactions to promote critical and experiential learning. Students' prior knowledge and varying perceptions of the community have an impact on their learning experiences and on "doing" geography. Also, students' perspectives and learning experiences are important contributors to their civic identities.

Understanding how and why students interact with their community can reveal important insights into their civic identities, which in turn helps educators shape curriculum around their needs and interests. Incorporating students' spatial narratives into the teaching and learning framework will promote active and engaged learning. Spatial narratives consist of how we perceive various places, whether through direct or indirect experience, and how we interact (or don't) with these places and why. They also include our perceptions of boundaries, defined as how spaces are delimited by socially constructed borders, which can have a profound influence on whether we feel like we belong or are excluded from particular places. The spatial narratives that we carry with us shape the way we view the world and our place in it because they are reflective of our perceptions (and misconceptions) about places.

Varying perceptions of places stem from differences in individuals' identities, life experiences, and prior knowledge. There is no correct spatial narrative of a community or neighborhood. Giroux (1997) suggested, "one's class, racial, gender, or ethnic position may influence but does not irrevocably predetermine how one takes up a particular ideology, reads a particular text, or responds to particular forms of oppression" (p. 150). Likewise, the way one interprets a landscape, the borders of neighborhoods, and one's position in a community are not predetermined. We do not start out feeling excluded or marginalized in a particular place, but direct and indirect experiences will influence our sense of belonging. Our spatial narratives have the capacity to change as we experience places directly and learn more about them.

Describing experiential learning in a university-level urban geography course, Elwood (2004) argued that connecting students' existing knowledge about places to new learning is an effective pedagogical approach. To design and implement the experiential learning component of the class, Elwood used spatial stories as a tool to understand her students' prior knowledge and perceptions of the urban neighborhoods they would study. Spatial stories reveal key "spatial practices," or the decisions we make about places we choose to occupy or avoid (De Certeau, 1984; Elwood, 2004). Elwood (2004) argued that "these stories mark out certain spaces as legitimate, accessible, and acceptable, and (by implication) designate others as inaccessible or unacceptable, and allocate or restrict spaces to particular individuals or groups" (p. 56). From a critical geography perspective, spatial stories could also serve as a means to understanding a sense of exclusion that individuals or groups may feel regarding certain spaces. From an educational perspective, we concur with Elwood that getting students to talk about and deconstruct the meaning behind their spatial stories of specific places will facilitate critical

thinking when learning more about these places. The challenge, then, is to uncover students' spatial narratives.

Mental maps, or cognitive maps, have been used as tools to understand how people view the world around them and their place in it. In essence, these are maps drawn from memory at varying geographic scales, from local to global. Shalev (2008) described five categories identified by Lynch (1960) that people use to organize their mental maps of environments, including paths (e.g., streets, walkways), edges (e.g., boundaries of a neighborhood), districts (e.g., specific areas of a city), nodes (e.g., specific points such as an intersection), and landmarks (e.g., a school building). Mental maps reveal significant places and boundaries specific to that area and to the person who drew the map. Although Lynch's research was applied to mental maps of cities, it can be applied to smaller sections of a city also, such as the neighborhoods in which students live or attend school. Students' mental maps of their neighborhoods can reveal how they perceive and interact with this environment as well as how they feel about their place in it.

For example, a student could be asked to draw a mental map of the world, and it will illustrate not only what she remembers or has been taught formally, but also what the student feels is important. An analysis of this map may focus on what she included, how reference points are positioned on the map, how much detail is included for particular places, and what is excluded from her map. Scholars have compared and contrasted students' mental maps of the world in different countries to suggest the various factors that contribute to perceptions, and sometimes misperceptions, of the world (e.g., Kong, Savage, Saarinen, & MacCabe, 1994; Saarinen,1973; Schmeinck & Thurston, 2007). Students' education, life experiences, cultural identities, socioeconomic status, and many other factors influence their mental maps and spatial narratives at the global and local scales.

Citizen Mapping for "Doing" Geography

One way to address the path to spatial citizenship and to expand spatial narratives is through citizen, or community, mapping, in which individuals collect geospatial data about their communities to make informational maps for a variety of purposes, particularly to effect political, economic, and social change. Citizen mapping is a collaborative effort between researchers, professionals, and citizens, which is typically guided by community members who are assumed to possess important local knowledge of their neighborhoods (Boll-Bosse & Hankins, 2018; Parker, 2006). Indeed, Flanagin and Metzger (2008) suggested that "individuals are in many cases in the best position to provide information that requires indigenous experience, esoteric understanding of a particular physical environment, and current information about local conditions" (p. 139). As such, citizen mapping can be used as a method to integrate students' local geographies into the curriculum and as a means of

enhancing content knowledge and building critical map literacy. The ability to construct and interpret maps with a critical eye has been viewed as a building block for citizenship (Milson & Alibrandi, 2008).

Mapping is a form of "doing" geography that has dramatically changed through advances in technology and the ability of citizens to access online mapping programs. Traditionally, geospatial technology included "the equipment used in visualization, measurement, and analysis of the earth's features, typically involving such systems as GPS (global positioning systems), GIS (geographical information systems), and RS (remote sensing)" (Cimons, 2011, p. 1). Today, however, our smartphones serve as miniature computers with geocoding capabilities that allow us to navigate areas more easily and track our movements across the landscape. There are a wide variety of platforms that can be used to input georeferenced information and to create maps through Internet-based programs, which opens up opportunities for integration into the curriculum more easily with little training or the financial burden associated with previously expensive software and equipment (Milson & Alibrandi, 2008). These advances in mapping technology provide a platform for participatory citizenship and the potential for having a positive impact on society.

Learning to think spatially and use geospatial technologies effectively enables students to be active, engaged citizens. Further, advocates of spatial citizenship have suggested that "a spatial citizen should be able to interpret and critically reflect on spatial information, communicate with the assistance of maps and other spatial representations, and express location-specific opinions using geomedia" (Jekel, Gryl, & Schulze, 2015, p. 38). In designing curriculum for spatial citizenship, researchers have recognized the potential for empowering students to see their world spatially, collaborating with each other, and contributing their own ideas and potential solutions to community challenges (e.g., Elwood & Mitchell, 2013; Gryl & Jekel, 2012; Schulze, Gryl, & Kanwischera, 2015; Strobl, 2008).

In using citizen mapping as a tool to include students' geographies, differing spatial narratives of the same neighborhood will be revealed based on students' varying experiences and interactions with the local environment. For example, in her research in Chicago, Elwood (2008) noted contrasting views of the same neighborhood by the Latino residents, who viewed it more positively than real estate agents (mostly White), who perceived it to be a dangerous community in decline. Further, "doing" geography through citizen mapping has the potential of expanding students' spatial narratives, but it may also simply reinforce students' pre-existing perceptions of the environment. Citizen mapping can empower students, who are familiar with their neighborhoods, with a platform to produce and share knowledge that will enhance their communities.

THEORETICAL FRAMEWORK

A critical geography perspective supports a collaborative, participatory approach, both in research and in the classroom, where researchers and

research subjects (teachers and students) work together to discover community issues and potential solutions. In a study designed to engage students in mapping local histories through participatory research, Mitchell and Elwood (2012) described students as active, engaged researchers while the researchers facilitated the learning of content and new skills. They argued that students will be enthusiastic about learning if it is connected to their social worlds and uses new forms of technology in engaging ways. Further, Pain (2003) suggested that participatory approaches align with the goals of critical geography because they provide opportunities "for excluded groups to highlight and act upon their own concerns" (p. 653). Indeed, a participatory approach to learning content and new skills experientially in the context of local communities is well suited to advancing the goals of critical geographers.

Traditionally, critical geography has focused on the processes that contribute to and maintain the exclusion of particular groups in a society. Critical geography emerged as a subfield in the 1980s and initially was connected to radical Marxist approaches that addressed the socioeconomic exclusion associated with capitalism. While socioeconomic differences are still among the foci of critical geographers, their research agenda has expanded to address other elements of identity, such as race/ethnicity, gender, sexual identity, and disability. Kitchen and Hubbard (1999) recommended that critical geography "research on social oppression and exclusion should be sensitive to the life experiences of marginalized groups" (p. 195). One way to be sensitive to the life experiences of students is to attempt to understand how they perceive and interact with their everyday lived spaces, such as home and school. This approach, too, has implications for civic education. As Schmidt (2013) contended, "Unpacking interactions people have in/with space is important for more complete understanding of the civic education people receive, education well beyond classrooms and textbooks" (p. 536).

While critical geographers explore a range of topics related to equity, power structures, and social justice with varying methods and epistemologies, a common theme that binds them is how spaces and places are constructed and represented around these issues. Our study focused on students' perceptions of their community, including areas of concern they identified as sources of potential inequity that contributed to their feelings of unfairness and injustice. We sought to explore these issues with them by providing them with guidance and the tools needed to articulate their concerns. As such, the geographies affecting their lives, particularly social justice and their interactions with the environment, were included in our research framework.

There is no universal definition of social justice because its criteria and manifestations vary among societies. Individual and group identities shape the notion of social justice, and power structures within a community impact the meaning of social justice at any given time. Harvey (1996) explained, "Like space, time, and nature, 'justice' is a socially constituted set of beliefs, discourses, and institutionalizations expressive of social relations and contested

configurations of power that have everything to do with regulating and ordering material social practices within places for a time" (p. 330). Social justice is inherently linked to geographical processes because quality of life varies within and among places. As Kobayashi and Ray (2000) suggested in their study of civil risk and landscapes of marginality in Canada, all social spaces are shared, and it is important to recognize the spatial construction of difference within society that contributes to the uneven distribution and access to resources. Although social justice is a contested concept, for the purposes of this study, we adhered to notions that it includes the distribution (and, at times, uneven distribution) of benefits in society, or equal access to a good quality of life. In short, social justice can be a measure of how fair we perceive the society to be.

Further, we sought to link social justice to civic identity in an effort to promote geography education that contributes to active participation in society. In a study that addressed children's geographies and social justice in primary education in England, Catling (2003) aimed to articulate the purpose of geography education for students (ages 4–11) with the assumption that their geographical experiences matter in constructing effective curriculum and cultivating active, engaged future citizens. Catling proposed a theoretical framework with the student in the center that integrated their direct and indirect experiences with the local environment ("the world at hand") and linked to larger regional, national, and global issues ("the world beyond"; p. 172). The model included the geographies that affect students' lives, such as the natural environment, the built environment, inequalities, systems, power, social environment, and political structures. The purpose of incorporating children's geographic experiences into the curriculum was to expand their geographic knowledge and perceptions of places and to advance students from submissive to active citizens as well as from disempowered to empowered actors in society.

We adapted and expanded the models of Catling (2003) and Pike (2011), which emphasized recognizing and including the geographies impacting students' lives in geography education. Figure 1 represents our conceptual framework for integrating students' geographies in order to engage them actively in experiential learning, to empower them to be active citizens, and to prepare them to think critically and spatially about issues at larger geographic scales beyond the local. The model places the student in the center surrounded by the local scale (Catling's "world at hand"), including direct experiences with the environment, and beyond this inner circle are the regional, national, and global scales (Catling's "the world beyond"), which are often experienced by students indirectly.

The geographies affecting students' lives are modified somewhat by the addition of a sense of belonging (or exclusion), more specific dimensions of human environment (e.g., cultural environment), and slight changes in the labels of other factors, such as geopolitics instead of "politicized" in their models. Similar to their framework, we have integrated recognizing and including students' geographies in teaching and learning. However, our model also adds examples of specific ways to increase engagement of students

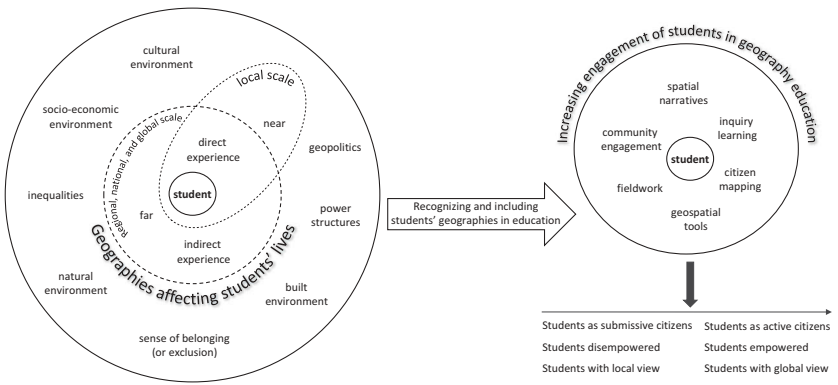

Figure 1. Framework for Including Students' Geographies and Increasing Engagement in Geography Education
Based on models of Catling (2003) and Pike (2011), adapted from "Curriculum Contested: Primary Geography and Social Justice," by S. Catling, 2003, *Geography, 88*, p. 172. © The Geographical Association. Adapted with permission of The Geographical Association. Permission to reuse must be obtained from the original rightsholder.

in geography education, such as spatial narratives, citizen mapping, geospatial tools, and fieldwork. Finally, we included their assumption that increasing students' engagement in geography education has the potential to move them along a continuum from submissive to active citizens and from disempowered to empowered, but we also added the possibility of broadening students' views from the local toward the global scale.

In our study, we aimed to take a critical geography approach, by integrating the life experiences and the local environments of traditionally underrepresented and marginalized students into the research design and outcomes. We wanted to provide a space for these students, who often felt excluded, to explore topics that they cared about in their community, particularly as they related to social justice issues, such as quality of life, housing, neighborhood blight, access to social amenities, and job opportunities. We aimed to understand how they perceived and interacted within their local environment, including the natural, built, and human dimensions of environment, as well as what forces contributed to a sense of exclusion and the delineation of the boundaries of community. Perhaps most importantly, we integrated opportunities for them to take action by discussing their concerns with community leaders in nonprofit neighborhood organizations, local and county governments, and the school district.

METHODOLOGY

Study Context

Location. The following brief description of the study area for this project, Toledo, Ohio, provides context for the community issues that students identified in this post-industrial city. Toledo is the fourth largest city in Ohio after Columbus, Cleveland, and Cincinnati. Over 40 Fortune 500 automotive-related companies once had their headquarters in Toledo. That number is now down to two. Toledo's peak population was recorded in the 1970 census at around 384,000. By the 2010 census, the population had dropped to 287,000. This decline is reflected in increasing vacancy and abandonment of property. Since the 1950s, out-migration by middle-class White households has led to disparities between the city and the region. For example, the median household income from 2011–2015 was $33,687 for the city and $41,777 for Lucas County, the county in which Toledo is located. Over the same time period, an average of 27.8% of Toledo's residents lived below the poverty level compared to 21.1% of the county's residents (U.S. Census Bureau, 2016a). Foreclosures have also occurred in greater numbers in the city than in the suburbs (Hammel & Shetty, 2013).

Further examination of recent data highlights the economic challenges in the region of Northwest Ohio. Unemployment rates in the

Toledo Metropolitan area and Lucas County have outpaced the country as a whole, due in large part to the decline in manufacturing employment opportunities (Bureau of Labor Statistics, 2016; Ohio Department of Job and Family Services, 2016). Additionally, the national poverty threshold in 2015 for families with three people was $18,871 and for families with four people was $24,257 (U.S. Census Bureau, 2016b). Between 2011 and 2015, 21.6% of Lucas County families earned, on average, less than $24,999 annually, compared to 15.7% of U.S. households. Over the same time period, the median household income in Lucas County was $41,777, compared to the U.S estimate of $53,888. Further, over the same time period, 27.3% of Lucas County residents accessed Food Stamp/SNAP benefits, which was more than double the national average at 13.2% (U. S. Census Bureau, 2016a).

Participants. We worked with students in grades 7–12 who were among traditionally underrepresented groups. The first summer workshop in June, 2015, served as a pilot for testing our project goals as well as the effectiveness of individual activities and assessment tools. We started out with 10 students, and eight of the 10 attended the entire 2-week workshop. All of the students were African-American (3 females and 5 males) in grades recently completed as follows: seventh (1), ninth (1), 10th (1), 11th (3), and 12th (2). In June, 2016, we added two teachers from Scott High School to the project to help us recruit student participants and to participate as facilitators of the summer workshop. Both of these teachers were popular among the student population, one an African-American female math teacher, and the other a White female language arts teacher who lived in the neighborhood near the school. As a result, we doubled the number of students from the previous summer to 17, with seven females and ten males (16 African-American and one of more than once race) having finished grades: eighth (1), ninth (5), 10th (4), 11th (3), and 12th (4).

As university faculty members, we recognized the multiple layers of identity–race, ethnicity, gender, socioeconomic, educational level–of both the researchers and the students who participated. The project team, who participated in the summer workshops, included four university faculty members representing four different disciplinary backgrounds (two White females, one South Asian female, and one White male), and two international, female PhD students (South Asian and African). Although none of the team members have lived in the neighborhood where the workshops were conducted, we were familiar with it through previous research in the community.

Workshop design and activities. To implement the goals established in this project, two 2-week summer workshops were offered in 2015 and 2016 at a local high school in an economically challenged part of the city. One of the earliest steps in the project was to create a teacher advisory

committee, consisting of both social studies and physical science teachers, who provided guidance to the project team regarding workshop design and format, curriculum development, assessment vehicles, and other practical suggestions.[1]

During both workshops, students engaged in self-selected collaborative groups of three to four students each by their topics of interest. They used spatial thinking to frame and examine questions that they developed to engage with and learn about their community.[2] Because we wanted to include students' geographies and integrate their prior knowledge, we modified a technique that has been commonly used as a strategy to promote active reading and comprehension in schools. The KWL (Ogle, 1986) is a tool in which each letter signifies a prompt for the reader: The K stands for "what do I know?"; the W for "what do I want to know?"; and the L for "what did I learn?" We used these questions in the current study as a means to build on the students' prior knowledge and to support students' thinking about what they already knew and wanted to know about the neighborhood. Modifications were made to the standard KWL to promote the expansion of students' prior knowledge and to facilitate the construction of researchable questions. Therefore, we added "What questions could I ask?"; "Where might I find the answers to these questions?" (to identify potential sources of data); and "Why is this important?" (to evaluate and substantiate their claims).

Using this approach, students brainstormed in groups to identify topics and define research questions. This method also supported our efforts to personalize the project for these students and to begin to unravel their spatial narratives. For each topic explored, students collected primary data (e.g., GPS data, photos, and observational notes) while conducting fieldwork and analyzing secondary data (e.g., local land bank data, county GIS database, census records, and ArcGIS online maps). Using a presentation template created by the research team to scaffold organization of their research process, findings, and recommendations, students presented their research to key community stakeholders. Specifically, students presented their questions (including why it was important to them), the data they collected (photos, maps, statistics), what they learned, and what they recommended to the mayor of the city, community officials, neighborhood organizations, school administrators, and their families.

Data Collection

Sketch maps and spatial narratives. Because the workshops were conducted in a neighborhood experiencing significant socioeconomic challenges, sensitive topics were approached carefully. We recognized that we were viewed as "outsiders," while the students claimed insider knowledge of the neighborhood surrounding the high school where the workshops took place. Moreover, positionality in regards to race, culture, age, and socioeconomic class had the potential of creating an exploitive relationship in which the

researcher is in a position of greater power than the research participants. We wanted to use an appropriate method to discover students' perceptions of their community, particularly considering the sensitive nature of neighborhood challenges and inequalities. Using elicitation techniques, or "research tasks that use visual, verbal, or written stimuli to encourage participants to talk about their ideas," was our primary method for revealing students' thoughts and feelings about the community and their place in it (Barton, 2015, p. 179).

Sketch maps were used as tools to capture student perceptions of the neighborhood prior to and after the workshop. This tool was developed to capture "unique spatial data of individual experiences, visualizing socio-spatial processes, breaking down particular barriers of positionality in research, and developing new uses of GIS" (Boschmann & Cubbon, 2014, p. 246). When using a sketch map, individuals are asked to draw on spatially referenced maps, aerial photographs, or prepared cartographic representations in order to "represent the unique and varied lived experiences of social groups, households, or individuals" (Boschmann & Cubbon, 2014, p. 238). Sketch maps have been described as "particularly useful for their ability to represent feelings, emotion, and experience" within a place (Pearsall, Hawthorne, Block, Walker, & Masucci, 2015, p. 7). As such, we employed them to determine how students' perspectives of the neighborhood were impacted by their prior knowledge and engagement in it. Further, Gillespie (2010) suggested that "the potential benefits of using sketch mapping to reveal cultural boundaries and sensitivities of students of non-dominant ethnicity, race, or culture help educators understand and teach students of other cultures more effectively" (p. 26). Asking students to draw sketch maps of their neighborhoods can reveal how they perceive and interact with this environment, as well as how they feel about their place in it, which is reflective of their spatial narratives.

Sketch maps have been used in a number of studies to document how people navigate and understand their surroundings spatially (e.g., Boschmann & Cubbon, 2014; Hawthorne, Solís, Terry, Price, & Atchison, 2015; Pearsall et al., 2015). Following a similar approach in which researchers were interested in how high school students perceived the university campus through sketch maps (Pearsall et al., 2015), we asked students to draw specific items on a map of the neighborhood surrounding the high school. The map used for this activity was selected in consultation with the Principal, the Schools as Community Hubs Director, a teacher, and a parent, all associated with Scott High School. The procedures for the activity were modeled by the project leader first by using a map of the university and the neighborhood around it. We emphasized to the students that there were no wrong answers in this exercise.

First, the students were asked to draw the boundaries of the neighborhood because we were interested in revealing the area they considered to be connected to the school. Second, on the same map, they were asked to draw circles around areas in the neighborhood they were familiar with using a green

marker. Third, looking at those areas, they were asked to use a pencil and draw a line from each of the circles to the blank area in the margin and explain how they know those areas. Figure 2 is an example of one student's sketch map of familiar areas.

We then gave them a second map of the neighborhood. First, they drew the boundaries of the neighborhood on this map, too. Second, they identified areas that they avoid and drew circles around them using a red marker. Third, they provided explanations for avoiding those areas in the margins of the map.

After finishing these maps, the activity concluded with three open-ended questions about the neighborhood:

1. How would you describe the neighborhood surrounding Scott High School to someone from out of town? (You can make a list or write in sentences).
2. How do you feel about this neighborhood?
3. Do you consider Scott High School to be the center of the community? Explain why or why not.

To ensure that the procedures for the sketch maps would be clear to the students, we piloted and revised this activity with the help of our teacher advisory committee prior to the workshops.

Student interviews. In addition to the sketch maps, we also conducted individual interviews with the students in Summer 2016 at the end of the workshop. Because the first workshop in Summer 2015 was designed primarily to be a pilot of the curriculum design and the sketch maps, we did not conduct interviews with students that year. However, we determined that adding these interviews to the second workshop would be a valuable source of individual perspective. The interview questions were linked to our research goals and were developed in consultation with our teacher advisory committee and an external project evaluator. Two of the seven interview questions were relevant to addressing the students' spatial narratives:

- What did you learn about your community that you didn't know before the workshop this summer?
- Did the experience change the way you view your community? (If so, in what way?)

The interviews were videotaped, transcribed, and coded. Additional interview questions that are not addressed in this article asked students to reflect on one or two things from the workshop they would always remember, skills they learned from participating, kinds of careers they learned about, and whether

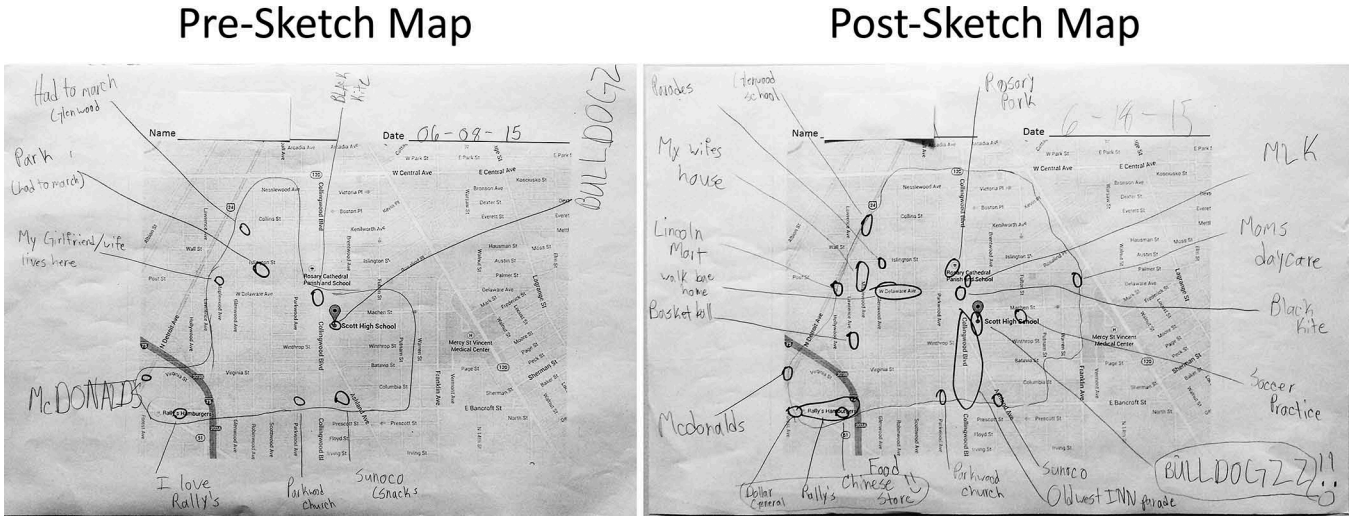

Figure 2. Example of One Student's Pre- and Post-Sketch Map

they would recommend the workshop to other students in the future (and why or why not).

Data Analysis

To evaluate how the use of spatial thinking, geospatial technologies, and citizen mapping enhanced student engagement in and knowledge of their communities, we analyzed responses to the pre- and post-sketch maps. The maps and the embedded open-ended questions addressed the supporting research questions related to how students described the neighborhood, what areas they were familiar with or avoided, and how they felt about it before and after the workshop. Pre- and post-sketch maps for this study were analyzed qualitatively, both manually and digitally using GIS, while the analysis of the written responses was facilitated by using MAXQDA, a computer assisted qualitative data analysis software that allows researchers to create coding schemas and make comparisons across demographic data, such as gender, age, and race/ethnicity. We looked for an expansion of knowledge through pre- and post-sketch maps, as well as written descriptions of the neighborhood. The pre-sketch map, which was completed on the first day, was used to document initial perceptions of the neighborhood around the high school where the workshops were held, and the post-sketch map was meant to capture changes in students' perceptions and spatial narratives.

We adopted the methodology used by Pearsall et al. (2015) to process and analyze the maps students produced during the summer workshops. A total of 50 pre-sketch maps and 40 post-sketch maps were scanned into JPEG formats at 600 megapixels. We digitized all scanned images in ArcGIS 10.3, using four major road intersections as control points. All maps were projected onto the Ohio North State Plane Coordinate System and converted into raster formats for further analyses and presentation. In some cases, avoided and familiar areas overlapped. The amount of overlap varied among participants, indicating variations in spatial narratives of the neighborhood.

Students' notes in the margins of the sketch maps regarding why they were familiar with or avoided particular areas were coded qualitatively using emergent coding based on their written descriptions. First, we scanned their handwritten responses, creating electronic documents that were then uploaded into MAXQDA, which facilitated the organization of the data and codes. The coding framework was emergent, constructed by examining students' answers to these questions. Likewise, students' responses to the three open-ended questions in the sketch map activity were coded using qualitative analysis, with both descriptive and analytic approaches depending on the question.

Students were interviewed individually on the next to the last day of the workshop. Students were asked the same questions in the same order by the researcher who had worked most closely with their group during the workshop. The videotaped recordings were transcribed and then imported as

documents into MAXQDA, where we created a coding schema based on their answers to the interview questions using the same method of analysis as the sketch map questions.

FINDINGS

Case Study

In order to facilitate interpretation of the data we collected, a case study of one of the student group's experiences illustrates how students' spatial narratives were affected by participation in the workshop, as well as the impact of students' prior knowledge on the questions they asked and the recommendations they made for the community. The "housing" student group of Summer 2016 consisted of five African-American males (four of whom had just completed ninth grade at the high school and one who would be entering ninth grade in fall). In their final presentation to the community, the housing group chose to introduce themselves by explaining why they participated in the workshop. They were all in agreement that a primary reason was to help or make a difference in the community, especially for future generations.

The housing group's initial discussion was focused on abandoned houses and how they impact the neighborhood. In regards to the "K" (what the students already knew) in the KWL method described above, the following suggestions were made by the students about this topic:

- Most people in the area of Scott [High School] rent their houses, while some own their homes.
- There are numerous abandoned houses around the neighborhood.
- The condition of the houses varies between the east and west sides of Scott High School.

Overall, they argued that the condition of the houses impacted the quality of life in the community. In framing their inquiry question, the students recognized that the city was facing a crisis due to foreclosures, which related to an increase in abandoned houses. Their initial research question, which represents the "W" (what the student wanted to know) was: "Do abandoned houses impact the value of other houses in the community?" To make a case for the importance of this question, the students suggested if houses were taken care of and occupied, more young people would want to stay in the community.

Before engaging in fieldwork in the neighborhood or collecting secondary data to answer this question, the students first made a plan regarding what streets they wanted to focus on by examining a large, printed map of the neighborhood. Because they only had two days for fieldwork, the students

pinpointed the areas they wanted to explore in advance by drawing routes on the map based on their knowledge of the neighborhood. With their pre-planned routes in hand, the students collected data on the east side of the school on the first day and the west side on the second day. The students took turns in various roles during data collection in the neighborhood (identifying "abandoned" houses, using the GPS unit to geotag these houses, making notes of the GPS coordinates and descriptions of each of the houses, taking pictures of the chosen houses, leading and making observations). They were accompanied by one of the university researchers and a PhD student who helped the students when they had questions about using the GPS unit or camera and suggested when it was time for the students to change roles. The students and researchers interacted with people in the community, especially when residents had questions about why the students were taking pictures or they wanted to make suggestions about neighborhood issues, such as potholes and sidewalks in need of repair.

It was revealing to watch the students select the houses that they believed were abandoned. They chose houses in obvious states of disrepair, with peeling paint, broken windows, unkempt yards, and crumbling roofs. After returning to the classroom, the students made surprising discoveries when examining secondary data related to these houses, resulting in the students' decision to clarify the differences between abandoned and neglected houses in their research. They had assumed that all of the houses they identified were abandoned, but discovered through research of secondary data that some of them were owner-occupied. They then hypothesized that these houses were neglected instead. As a result, the housing group determined that it was important to explain the difference between abandoned and neglected houses in their final presentation to the community.

While students brainstormed the kinds of data, such as housing values, unemployment rates, and home ownership, that would be helpful for answering their questions, the project team instructors made recommendations for potential websites and organizations where they could find this information. An essential secondary source for addressing their inquiry question was the Lucas County Auditor's Real Estate Information System (2015), which included a database of all properties in the community, their values over time, photos, tax and ownership records, and layers of historical and current GIS maps. They also consulted the Lucas County Land Bank (2014), which had conducted a study ranking the condition of properties in the county. With the properties they had geotagged in the neighborhood, the students used a sample of abandoned and adjacent occupied properties to find the percentage change in value of the house between 2009 and 2015. They wanted to determine if the abandoned houses had an impact on neighboring occupied houses and whether the impact was the same on the east and west sides of the school. The group created a spreadsheet with all of the properties they selected during fieldwork and the addresses for occupied properties next door to these.

They then noted the values for both in 2009 and 2015. To put their results into perspective, they compared the percentage changes to the median housing values at the city level.

In addition, they created maps in ArcGIS online by uploading their geotagged data points of abandoned houses and selecting secondary data layers, such as unemployment rates, provided in the software (see Figure 3). The stars on the map in Figure 3, some overlapping, are the geotagged houses the students identified as abandoned. The background data are unemployment rates in 2015. Although the students did not mark the location of the high school on the map, it is situated in the middle of the houses they selected and serves as a boundary between the east and west sides of the neighborhood. The initial fieldwork seemed to support their prior knowledge that more abandoned houses could be found to the east of the school.

What did the housing group students learn from their experience with citizen mapping? As for the "L" in the KWL, this group noted, "We discovered there were more abandoned properties to the east of the school than the west. This could be because the unemployment rates are higher on the east side." In addition, they learned that housing values all around the Scott High School neighborhood have declined more than the city of Toledo median change in house values and that east side houses had declined at a higher rate than those on the west side. In viewing a map of the city of Toledo created by the Land Bank, students learned that there was a concentration of homes rated as D (deteriorated) or F (hazardous) in the areas in the central city, including the neighborhood around their school, where the east side had a greater proportion of vacant homes than the west side. These sources reinforced what they learned while doing fieldwork in the neighborhood and provided them with specific data to support their hypothesis and conclusions.

With this information and their student-created maps as illustrations, the housing group presented their questions, research process, findings, and recommendations to key community stakeholders, such as the mayor, Department of Neighborhoods, and neighborhood organizations. The students recommended that the abandoned houses should be turned into something more beneficial to the community, such as recreation spots, parks, or community gardens, suggesting this action could reduce crime and improve the quality of life. This step in the learning process moved them along the continuum from submissive to active citizens, and from disempowered to empowered.

This case study describes only one of the student groups' experience using citizen mapping in the neighborhood surrounding the high school. Other student groups explored topics such as crime, community needs, employment opportunities, parks and gardens, and youth centers. In order to understand what students learned during this process, we used data collection tools designed to capture their spatial narratives and to integrate their geographies into the learning process. We aimed to capture changes in their knowledge and perceptions of the neighborhood.

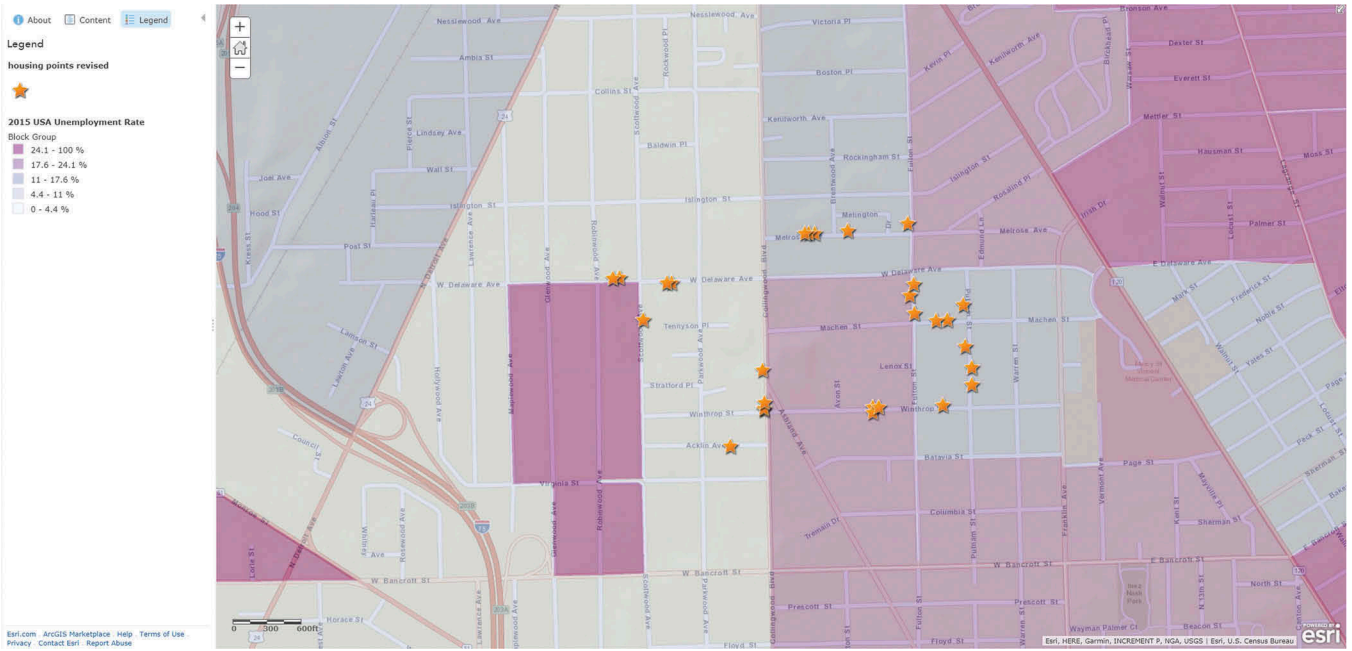

Figure 3. Housing Student Group's Map of Data Points With ArcGIS Online Unemployment Map

Sketch Maps

Because the sketch maps were used in the same way for both summer workshops, we have combined the results of six students in Summer 2015 and 14 students in Summer 2016 who completed both the pre-and post-sketch maps. Although 25 students participated in the workshop, only 20 of them drew both sketch maps for various reasons (e.g., leaving early for vacation). Figure 4 represents all of their pre-sketch map *familiar* areas combined and digitized using GIS.

The areas of the map that appear darker are those where more students indicated they were familiar. For example, in the pre-sketch map, a hotspot appears on the right side of the map where 64% of the students circled the hospital. There is also a hotspot where the school is located near the center, illustrating its significance in their spatial narratives. Also familiar to a large percentage of students was the intersection in the southwest section of the map, which appears as a corridor rather than a single place, and, more specifically, is a stretch of fast food restaurants. As is evident in their written explanations, familiar areas were often associated with the routes the students took to and from their homes to specific points of destination, such as school, restaurants, and friends' houses. Overall, the areas in the pre-sketch map were more pinpointed around specific places or routes, leaving many parts of the neighborhood as unfamiliar to the students.

However, in the post-sketch map of familiar areas (Figure 5), a larger portion of the overall neighborhood is highlighted by the students. While many of the hotspots that appeared in the pre-sketch map (Figure 4) also reappeared in the post-sketch map, a larger portion of the overall map is filled, and the space of familiar areas has expanded. In short, there are more places and corridors indicated by students as familiar in the post-sketch map. Perhaps not surprisingly, these additional areas were representative of the streets where students conducted fieldwork during the workshops, which indicates that participation expanded some of the students' spatial narratives of the neighborhood.

A more nuanced understanding of these familiar areas can be deduced from the hand-written comments on their maps. Table 1 includes the reasons why these areas were familiar to the students in both the pre- and post-sketch maps as indicated in the margins of students' maps. While the major factors of food, school, where they live or have lived, family, and friends are important at both the beginning and end of the workshop, there were a few notable changes in students' post-sketch maps. For example, there was an increase in students who specifically circled and labeled parks or community gardens that they learned about during the workshop (2.2% in the pre-sketch map and 7.1% of all factors in the post-sketch map). In a similar example, there was a slight increase from 1.5% to 3.5% in highlighting youth clubs, which was a topic that one of the student groups examined with the suggestion that abandoned

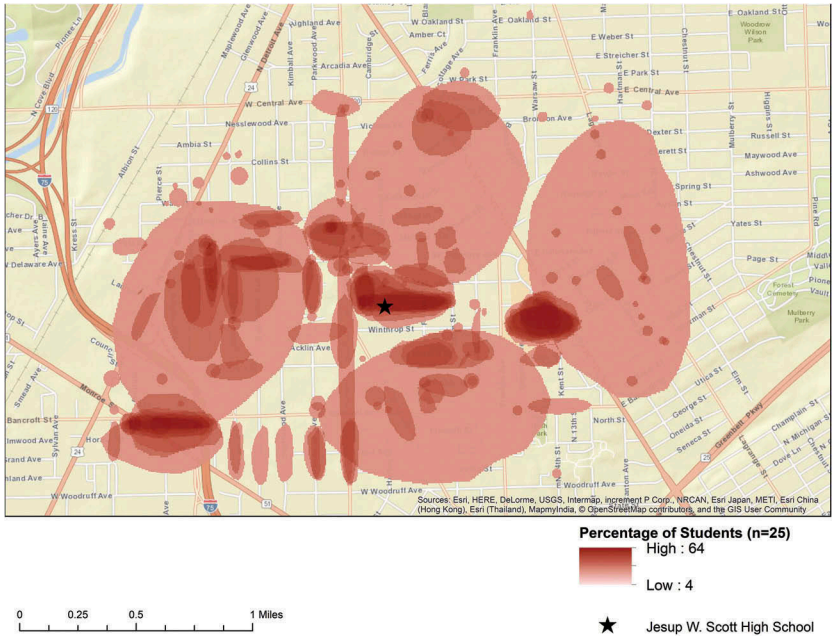

Figure 4. Pre-Sketch Map of Familiar Areas in the Neighborhood

properties could be converted for use as new clubs or basketball courts for youth in the neighborhood. These changes reflect an expansion of spatial narratives directly related to what they learned from exploring these specific topics during the workshops.

The results of the pre-and post-sketch map avoided areas provided evidence of expanding spatial narratives also. Figure 6 includes the students' avoided areas as indicated on the first day of the workshop. Like the pre-sketch map of familiar areas, students highlighted specific points, corridors, and areas, but left large portions of the map blank. The pre-sketch map of avoided areas is relatively balanced between the east and west side of the school.

There seems to be more agreement among students in the post-sketch map regarding specific areas they avoid, as is evident in the concentrations of darker areas on the map (see Figure 7). In the post-sketch map of avoided areas, the east side of the school stands out more prominently than the west side. There are boundaries marked by major streets that represent a border between one neighborhood and another in the spatial narratives of these students and of people living in the community. Figure 8 is a compilation of the students' boundaries in the post-sketch map.

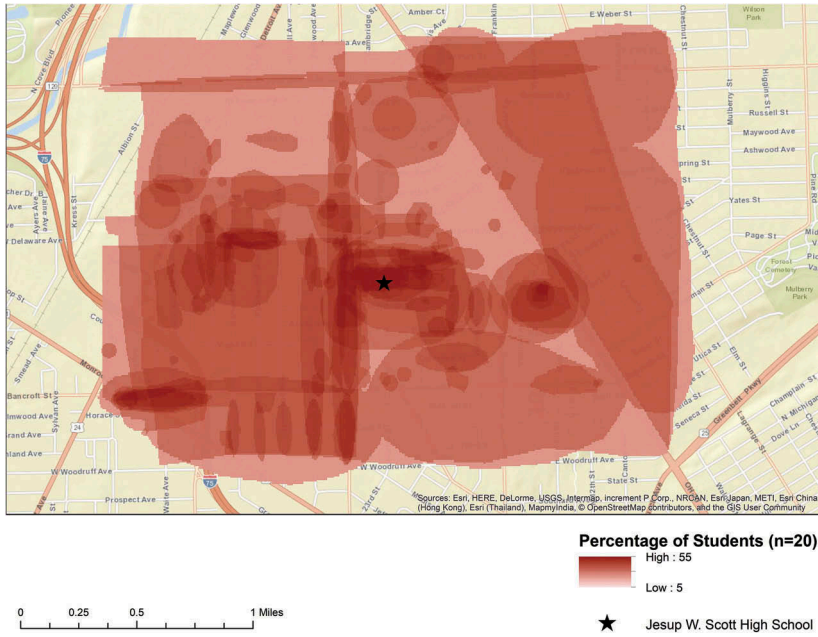

Figure 5. Post-Sketch Maps of Familiar Areas in the Neighborhood

For example, Cherry Street, which runs at a diagonal on the east side of the map, separates a residential area near the school from another residential area to the west of this street. Cherry Street could be considered a "hard" boundary, and it includes a number of churches, a homeless shelter, and a large Catholic school. The overall neighborhood around the high school is bounded on all sides by major transportation routes that serve as boundaries in these students' spatial narratives.

Although one of the student groups examined crime and surveillance in the neighborhood, the changing spatial narratives of avoided spaces is not accounted for in their discoveries or recommendations. Instead, it is better understood by examining the written comments tied to these places. Casual observers might assume that they avoid certain areas for negative reasons, such as crime. Indeed, Table 2 seems to support this assumption because crime as a factor increased from 28.4% in the pre-sketch map to 40.4% in the post-sketch map.

However, their written explanations expose more complex reasoning. In the pre-sketch map, several students circled areas and simply wrote "safety" in the margins, so those were coded as "general safety" along with responses by other students who had written comments about potholes or traffic congestion. However, in the post-sketch map, many of the areas that had been labeled as

Table 1. Pre- and Post-Sketch Maps Familiar Areas, Summers 2015 and 2016

"For each of the green circles, please explain how you know these areas in the margin of the paper."

	Pre-Test[a]		Post-Test[b]	
	n	%	*n*	%
Factor				
Food-Related	25	18.5	24	17.0
Location of a school	21	15.6	17	12.1
Live(d) or stayed there	19	14.1	16	11.3
Connection to family	17	12.6	19	13.5
Connection to friends	16	11.8	12	8.5
Hospital	11	8.1	7	5.0
Route to and from school	5	3.7	9	6.4
Other businesses	5	3.7	4	2.8
Church	5	3.7	3	2.1
Park	3	2.2	10	7.1
Barber shop	3	2.2	2	1.4
Youth clubs and sports	2	1.5	5	3.5
Parade route	2	1.5	2	1.4

[a]Students circled multiple locations on the map, so each had more than one factor listed. $N = 135$ codes for the pre-test.

[b]$N = 141$ codes for the post-test.

Note. This test was the same for both summers. Only students who completed sketch maps and responses for both pre- and post-tests were included in the analysis, which examined 6 students in 2015 and 14 students in 2016.

"safety" changed to more specific responses, such as "rapist" or "drug dealers." Students were more specific in their explanations in the post-sketch maps, which could be attributed to them being more comfortable about being open with us toward the end of the workshop. Beyond crime, students indicated that they avoided places where they were unfamiliar with people or the area or when they simply did not like the place. These practices of interacting (or not) with places, direct and indirect experiences, and prior knowledge contributed to students' spatial narratives of this neighborhood.

The three open-ended questions connected to the sketch map activity also support a deeper understanding of the students' spatial narratives of the neighborhood around the school. The first question asked the students to describe the neighborhood to someone from out of town (see Table 3). General characteristics, such as "fun," "quiet," "everything you need can be found there," and "great place" were the most common responses. Students also highlighted housing in the neighborhood by mentioning both abandoned homes and nice, historic homes

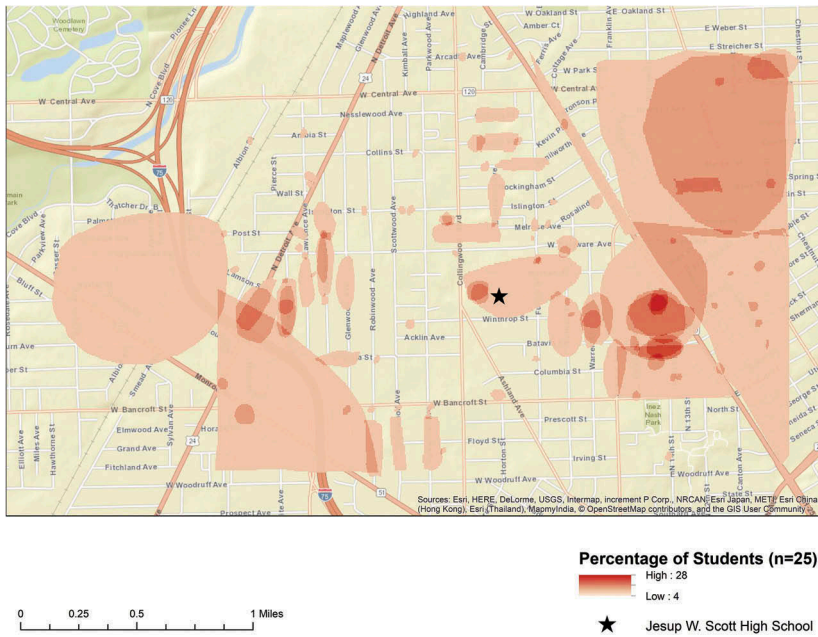

Figure 6. Pre-Sketch Maps of Avoided Areas in the Neighborhood

with pretty yards. The people in the neighborhood were described as friendly, numerous, and noisy (in reference to children). Social spaces included the art center, churches, and streets where festivals and parades occurred annually. Interestingly, several students also included warnings in their descriptions to potential visitors. For example, one student explained, "It's an OK neighborhood. It is a gang area, but as long as you play it cool, you will be fine. Just be aware of your surroundings" (11th grade male).

The second question asked students how they felt about the community. Table 4 includes a breakdown of whether their feelings were clearly positive, negative, mixed (both positive and negative), or neutral. Comments, such as "I think the neighborhood is cool for real, but it's just the people around the area make it look bad and dangerous," represent the mixed feeling of many of the students. Many commented that the neighborhood had both positive attributes and significant challenges in both their pre-and post-responses. While there were not any major changes in the proportions of types of feelings about the community in general, there were qualitative differences in the specific comments they made.

Focusing on "mixed" feelings, which accounted for the largest percentage of responses, in the pre-sketch map responses students described their feelings in more simplistic terms, such as "It has its good and its bad" (10th grade

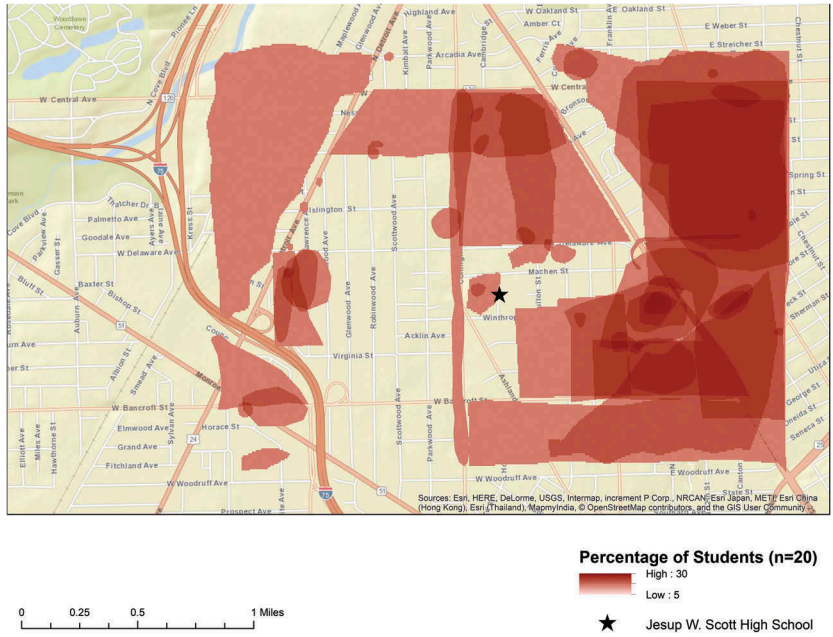

Figure 7. Post-Sketch Maps of Avoided Areas in the Neighborhood

female) and "I feel like certain parts of the neighborhood are great (mainly all the historic homes). Also, I feel like it has some unsafe parts" (9th grade male). While many of the responses were mixed in the post-sketch map also, they were more hopeful and highlighted the potential of the neighborhood to improve with help from the community. One student noted, "I feel like it has gotten safer over the years" (11th grade male), and another responded, "I feel like this is a nice neighborhood that needs a lot of work with help from the community" (9th grade male). The changing spatial narrative of an 11th grade female student is captured in her comment, "I used to think it was a bad neighborhood before this [workshop], but now I know it isn't."

The last open-ended question of the sketch maps asked students whether they considered Scott High School to be the center of the community and to explain their response. At both the beginning and end of the workshop, the majority of students placed the high school at the center of the community (80% and 90%, respectively). Only one student said both "yes and no," and one said "no" both times, claiming, instead, that the entire school district was the center of the community. Two students who wrote "I don't know" in the pre-sketch map changed their responses to "yes" in the post-sketch map. The reasons associated with the "yes" responses ranged from the size of the school to the role the school played in social interaction in the community. The results

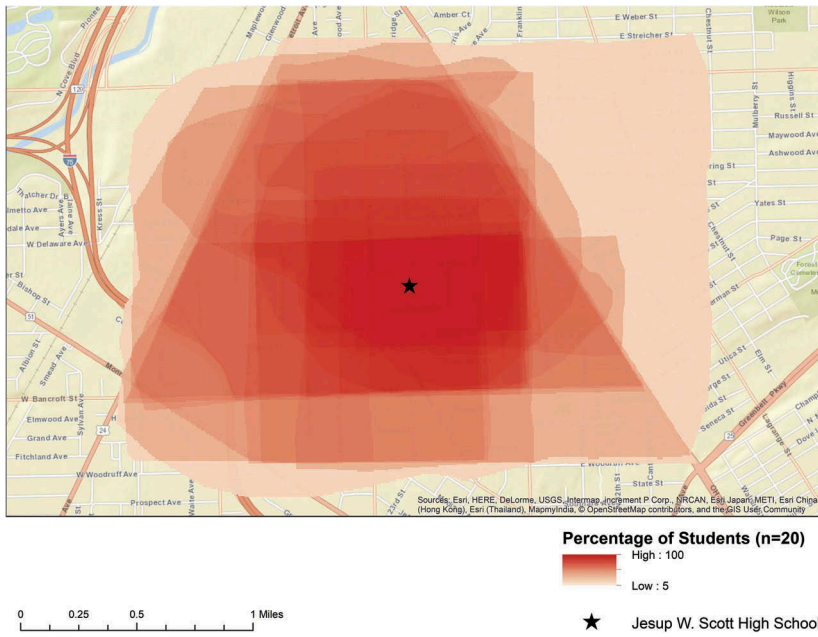

Figure 8. Post-Sketch Maps Neighborhood Boundaries

align with the boundaries the students drew of the neighborhood (see Figure 8).

Interviews

Finally, interviews with individual students in Summer 2016 indicated changes in both what they learned about the community as well as the way they viewed it. In answering the question about what they learned about the community that they did not know before the workshop, students focused on the specific topics they explored in their groups. One student group asked if abandoned houses impacted the value of neighboring houses and the overall quality of life in the neighborhood. A ninth grade male student remarked, "I really learned that there is a lot of abandoned houses and that this community needs a lot of work but it still has great potential." Students observed a difference in both the quality and values of homes between the east and west sides of the school, which contributed to discussions of inequality, as well as the socioeconomic and built environments.

A second group wanted to map out the community gardens and parks in the neighborhood and determine what amenities they had to offer in comparison to parks in other neighborhoods in the city. A female who had just

Table 2. Pre- and Post-Sketch Maps Avoided Areas, Summers 2015 and 2016

"What areas do you avoid (or stay away from) around the school neighborhood?"				
"For each of the red circles, explain why you avoid the areas in the margin of the paper."				
	Pre-Test[a]		Post-Test[b]	
	n	%	*n*	%
Factor				
Crime	19	28.4	23	40.4
Don't know people or area	14	20.9	16	28.1
General safety	10	14.9	4	7.0
Don't like it	9	13.4	7	12.3
Spend money at place	4	6.0	2	3.5
Avoid or hate school	4	6.0	2	3.5
Avoid fast food or snacks	3	4.5	1	1.8
Not a member of church	2	3.0	1	1.8
Reason unclear	2	3.0	1	1.8

[a]Students circled multiple locations on the map, so each had more than one factor listed. $N = 67$ codes for the pre-test.

[b]$N = 57$ codes for the post-test.

Note. This test was the same for both summers. Only students who completed sketch maps and responses for both pre- and post-tests were included in the analysis, which examined 6 students in 2015 and 14 students in 2016.

completed 12th grade explained, "What I learned about my community is that all the various parks that are around Scott high school because I didn't know none of them or the gardens. I learned what those parks and gardens had to offer." Students were surprised when a presentation by a city councilwoman, one of the invited community guests during the workshop, revealed that the district surrounding the school had the largest number of parks of any district in the city. However, many of the parks in their neighborhood were categorized as "pocket parks" with few to no amenities, such as picnic tables, grills, playground equipment, or basketball courts. To access parks with more amenities, students in this neighborhood had to travel by car or bus to another part of the city or to the suburbs. Students perceived this difference in access to quality parks as unfair and proposed using abandoned properties in the neighborhood as sites for the construction of new parks with better amenities.

Somewhat similar to the sketch map question asking how they feel about the community, we included an interview question asking students if the summer workshop changed the way they viewed their community, and if so, in what way. Of the 14 students interviewed, eight reported "yes," four "yes

Table 3. Sketch Map Question: How Would You Describe the Neighborhood Around Scott High School to Someone From out of Town?

How would you describe the neighborhood around Scott High School to someone from out of town?						
	Pre-Test[a]			Post-Test[b]		
Response	Number	Percentage of Codes	Percentage of Participants	Number	Percentage of Codes	Percentage of Participants
General characteristics	16	21	80	14	28	70
Housing	14	18	70	2	4	10
People	12	15	60	4	8	20
Social spaces	10	13	50	7	14	35
Businesses	8	10	40	3	6	15
Crime	5	6	25	4	8	20
Infrastructure	5	6	25	1	2	5
Warnings	4	5	20	7	14	35
Schools	3	4	15	5	10	25
No response	1	1	5	0	0	0
Historical[c]	0	0	0	3	6	15

[a]$N = 20$, and there were 78 codes, accounting for more than one response from each student.
[b]$N = 20$, and there were 50 codes, accounting for more than one response from each student.
[c]This code was not included in the pre-test.

Table 4. Sketch Map Question: How Do You Feel About This Neighborhood?

How do you feel about this neighborhood?				
	Pre-Test		Post-Test	
Response	Number[a]	%	Number	%
Positive feelings	6	30	7	35
Negative feelings	1	5	1	5
Mixed feelings	9	45	10	50
Neutral feelings	4	20	2	10

[a]$N = 20$ (6 students in Summer 2015 and 14 students in Summer 2016).

and no," and two "no." Their responses to this interview question were thoughtful and sophisticated. An 11th grade female explained:

> Yes, the experience did change how I feel because from the different people we had come and talk, the majority of them said it's not that the people in the community don't care. It's just that the different aspect of trying to pay for a house or what's around the neighborhood makes it hard for people to take care of a house, a park or a garden.

A female student who had just graduated added, "This experience taught me that I actually care more about my community. It made me care more about my community." A 9th grade male student said, "Well, I mean it didn't really change the way I view the community but it also did. It's just like it changed my view a little bit because I didn't really know that there were so many people interacting with the community trying to change it."

For many of the students who reported that the workshops did change the way they viewed the community, the interactions they had with guest speakers during the workshop were revealing and generated a number of questions from the students. Among the speakers that addressed issues of inequity in the community were a representative from the Toledo Fair Housing Center who spoke to them about discrimination in housing and their mission to combat it, a city council member who addressed the diversity of parks and differences in amenities across the city, a university faculty member who talked to them about foreclosures and discriminatory predatory lending practices, and an intern from the police department who discussed how they were using maps to pinpoint crime hotspots in the city. Each of the guest speakers addressed these issues spatially by using spatial data and maps, and they explained how they made a difference in the community in their careers. These interactions with community leaders were reinforced when the students had the opportunity to present their work and recommendations to these individuals at the end

of the workshop, giving them an opportunity to continue the dialogue and empowering them as citizens.

DISCUSSION

Couldry (2010) declared, "Having a voice is never enough. I need to know that my voice matters; indeed, the offer of effective voice is crucial to the legitimacy of modern democracies" (p. 1). Students involved in the summer workshops illustrated an expansion of their voices, using geographic tools and methods to develop and share their personal spatial narratives. This development was only possible if we built on the students' pre-existing spatial narratives and offered students opportunities to identify and investigate topics of interest to them. Because their research foci emanated from their personal interests related to the local community, the students had a personal investment. Accordingly, we observed that they were enthusiastic about conducting fieldwork, engaging with community members, and even doing research on secondary data to answer their questions and support their findings. Providing learners with a roadmap for understanding local challenges sets the stage for them to conceptualize similar issues at larger geographic scales. Examining the quality of life at the local scale, for example, may enable students to appreciate similar injustices at the global scale.

Certainly, beginning with students' interests is not a new approach in education and curriculum development. Our innovation integrated a variety of learning experiences that introduced students to spatial thinking and geospatial tools through a critical examination of topics embedded in their everyday geographies. In particular, citizen mapping allowed these students to exercise their voices by expressing their understanding of the geography of their lives with powerful and convincing visual artifacts. It was clear that the students understood the geographic tools and processes used to generate their maps as they discussed the condition and value of homes, unemployment rates, location of parks, and the concentration and nature of criminal activity with key community stakeholders. Moreover, as they presented their citizen maps of the spatial distribution of these inequalities, students were engaged as active rather than passive citizens (Pike, 2011) and were empowered in their roles as experts (Catling, 2003). Perhaps most importantly, students were able to use their voices to communicate possibilities for addressing injustices in their community.

Through their spatial narratives, students shared their perceptions of neighborhood boundaries and their experiences within the place. As a result of their participation in the workshop, students revealed that their boundaries expanded, both literally and figuratively. Students' sketch maps illustrated that the area known to them expanded, and they were more concrete in their descriptions of areas that they avoided. Their spatial narratives, as illustrated in the sketch maps, served the purpose of getting students to think critically

about how and why they were familiar with or avoided certain spaces in the community. While the geographies affecting their lives included all of the elements from the left side of Figure 1, inequalities, a sense of belonging (or not) in specific places, the built environment, socio-economic environment, cultural environment, and natural environment were the most prevalent in their explanations. The expansion of their spatial narratives that occurred did not necessarily improve their perceptions of the neighborhood or diminish their feelings of inequity. Indeed, some of their findings supported their prior knowledge and beliefs about the community.

However, there was evidence that students' perceptions changed as their knowledge of the community expanded by engaging in the approaches to geography education indicated on the right side of Figure 1 (e.g., community engagement, field work, citizen mapping, and inquiry learning). Spatial narratives revealed that misconceptions were evident across all groups and students. When canvassing the neighborhood, the housing group identified owner-occupied homes as abandoned; students investigating crime realized that it occurred on both the poorer east side and the seemingly more affluent west side of the school; the parks group learned that there were many more open spaces and parks than anticipated; and the employment group noted that there were unanticipated opportunities for youth in the neighborhood. Students were able to confront these misconceptions through the inquiry research approach they used. Understanding how to access, interpret, and use information is fundamental to civic engagement and critical geography.

Our observations of students engaging with critical geography align with the Mirra, Morrell, Cain, Scorza, and Ford (2013) description of "critical democracy," which they expressed as "students using social inquiry to gather, interpret, and disseminate data that represent their voices and views related to the struggles they experience every day" (p. 6). Introducing traditionally underserved students to the potential of geographic tools and methods to address social injustices and to improve the quality of life in their community provided them an opportunity to engage in authentic civic action. Students readily assumed the role of citizen as they took "critical stances to help [them] rethink what is 'normal' or acceptable about both the lives they lead and the changes they would like to bring about" (Levinson, 2014, p. 69). As a whole, student responses illustrated civic awareness as they recognized inequalities in some of the amenities and services available in their neighborhood compared to others. Students realized that simply observing inequalities as submissive citizens was not going to effect meaningful change. Instead, they understood that they needed to actively engage as citizens in the community in order to address social justice issues. One student eloquently captured this ideal when she explained, "I would tell the youth in the community that you can't just sit back and complain about how things are changing in the community if you aren't changing them." This comment also illustrates important elements

related to civic identity, including connection and responsibility to the community (Atkins & Hart, 2003).

Experiential learning and citizen mapping allowed students to explore and articulate their spatial narratives and connections to the community. While the students clearly had voices prior to the workshop, the experience of having people who they perceived to be in positions of power listen to them and take their concerns seriously was an empowering experience for them. Further, the students were introduced to tools, data sources, and methods that they can use in the future to explore other social justice issues. Perhaps most importantly, the students learned the value of working collectively in groups to articulate their theories and create solutions.

Understanding students' spatial narratives and integrating them into the learning process is an effective way to enhance a sense of connection to the community. Personalizing citizenship promotes a sense of personal responsibility and allows students to understand the structural dimensions of the challenges faced in the community. While their spatial narratives can be expanded through a participatory approach ("doing" geography, for example), their narratives also enhance our understanding of communities. To be clear, the purpose of participatory research and learning is not to enforce a dominant paradigm, but rather to reveal and appreciate students' prior understandings. As Elwood (2004) explained, "Bringing students' spatial stories into the learning process is an essential precursor to critical learning, since the experiences they have in the field may reinforce, contradict or transform these existing narratives" (p. 60). While it is important to understand and acknowledge students' perceptions and previous experiences, it is equally important to engage them in thinking critically about the origins of their spatial narratives to empower them as active citizens.

Our study was designed to unravel students' spatial narratives and to integrate them into "doing" geography. Citizen mapping was used to explore students' interests and concerns about the community and to provide them with a means to present their findings and offer solutions to community leaders. The process of thinking spatially about a community promotes critical thinking and provides tools for social change. Empowering students to see the world spatially has the potential to expand their spatial narratives and to deconstruct socially constructed borders in the community that impact their sense of exclusion and belonging. Ultimately, this approach to geography education provides students with a framework for understanding social justice at the local scale that can be applied to more complex issues at the regional, national, and global scales.

IMPLICATIONS AND CONCLUSIONS

We aimed to provide a framework for including students' geographies and increasing engagement of students in geography education for both informal

and formal learning environments. While we conducted our study during a two-week summer program, we also piloted the related curriculum in the classrooms of our teacher advisors, who offered valuable feedback for adapting it to formal settings.[3] We understand the challenges that social studies teachers face in aligning curriculum to content standards, assessing students' performances, and finding time to integrate new tools and methods in their classrooms. Thus, the resulting curriculum provides scaffolding for teachers to make links to appropriate standards, a variety of evaluation and assessment tools, and suggestions for using only segments of the curriculum module when time is limited.

Social studies education includes a variety of standards connected to civics and geography education. Increasingly, educators recognize the value of thinking spatially about today's challenges and social justice issues. Understanding why inequities vary from place to place at different geographic scales requires a spatial lens. As such, geography education is an integral part of civics education and, more specifically, social justice education.

We agree with Blevins, LeCompte, and Wells (2016) that "effective civics instruction must value young people's experiences, encourage them to use their voice and experiences in investigating community issues … and help students understand how to make a difference" (p. 376). By recognizing and including students' geographies in the classroom, teachers can choose from a variety of methods, such as citizen mapping, to increase students' engagement in geography education. Providing students with opportunities to think spatially and critically about the issues that are an important part of their lives will prepare them to be active, empowered citizens.

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NOTES

[1] For a detailed outline of the workshop or a description of daily activities, contact the corresponding author for copies.

[2] This element of the study aligns with recommendations of the Road Map for 21st Century Geography Education Project, which calls for educators to "design instructional materials that build upon students' prior geographic knowledge and experience and challenge students' thinking" (Schell, Roth, & Mohan, 2013, p. 8).

[3] Currently, we have developed six curriculum modules, including parks & community gardens, crime, housing, youth employment, open/green space, and historical geography. Please contact the corresponding author for copies.

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