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Fostering civic engagement through native maps: a preliminary study

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IDC '18, June 19–22, 2018, Trondheim, Norway
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ACM ISBN 978-1-4503-5152-2/18/06\$15.00
<https://doi.org/10.1145/3202185.3210780>

Abstract

School mission statements promising to transform students into leaders have become commonplace. Yet there appears to be a disconnect between educational practices and their application to real challenges pertaining to students' communities and to society as a whole. This gap results in a low sense of agency and presents an opportunity to develop tools that foster informed civic engagement and participation.

In this paper, we describe a participatory design study conducted with high schoolers from multiple cities in California, USA. After four months, researchers and students developed an interactive map-based tool to weave narratives of local participation and lead adolescents to act upon their neighborhoods' challenges. By manipulating map layers, students were able to augment physical spaces and learned to conceive critical stories about their surroundings. Our preliminary results show that the context of use, sustained interest, and motivation are key factors of success. We finish this article by describing the upcoming steps of our work.

Author Keywords

Place-based learning; civic engagement; citizen education; participatory design; native maps; HCI.

ACM Classification Keywords

• Human-centered computing ~ Interactive systems and tools; ~ Participatory design;

Introduction

Many school mission statements involve transforming their students into active leaders of their communities (Figure 1). Nevertheless, there seems to be a disconnect between school practices and their application to the challenges encountered in students' neighborhoods. Our research shows that this gap fosters a mindset of disempowerment amongst students. In most cases, adolescents from low-income backgrounds either reported that "nothing would ever change" in their surroundings or that problems were solely the government's responsibility.

For our study, we hypothesized that maps created by adolescents would lead to an increased and more critical awareness of each neighborhood's problems and potentialities and to a desire for civic engagement and participation. We tested our hypothesis through an exploratory survey, a cycle of participatory design sessions, and follow-up interviews.



Figure 1: A mission statement in a California high school: "All students will graduate college ready, empowered with the knowledge, skills and passion to positively impact their own lives, community and the global society."

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Background

Opportunities for students to co-design solutions for their local communities help them understand that problems are not immutable. Freire [6] fiercely debated about the transformations learners go through when they leave a "banking" education and acquire a state of critical consciousness about the roles they play in society. Alas, there seems to be an absence of learning opportunities that involve community engagement, resulting in a civic education gap [12] across the United States. In particular, low socioeconomic status (SES) students are less likely to develop a strong civic identity and participate in the social, cultural, and political aspects of their communities in a justice-oriented manner.

Similarly, Kahne and Middaugh [11] demonstrated that white college-bound students in higher SES schools are usually more exposed to opportunities of civic engagement than their lower income counterparts. Education institutions need to find ways to reduce this gap and offer students meaningful learning experiences that directly connect subject content with their lives and culture.

Basso [1] clarified how people can learn directly from experiences situated in places. Wisdom, he posits, consists of connecting localities, events, and stories. However, this depends directly on developing a sense of space, a multilayered relationship with the environment one inhabits or visits. In fact, we found that maps are epistemic tools capable of facilitating this connection.

We also drew from Soja's [15] concept of "Thirdspace": the idea of multiple layers of meaning when thinking about a physical space. Harris and Weiner [7] contribute to this discussion by asserting that maps are powerful instruments for knowing about places in all of their dimensions: historical, social, and cultural, among others. Landscapes, therefore, should be understood by their residents in a critical, multidimensional way.

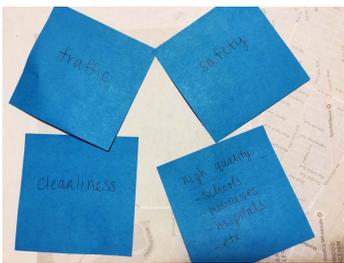


Figure 2. Students brainstormed about neighborhood challenges most relevant to them.



Figure 3. Students annotated and created layers on paper maps.

Call to Action		
What does the data point to?	What do we think is needed?	How does this help improve the city?
<p>The data points that it is happening near downtown.</p> <p>many families are affected by this because they have to move away.</p>	<p>is there we need to find out why it is happening and what resources are available so we can share them.</p>	<p>this can provide answers and resources to families/communities.</p>
data	insight	action

Figure 4. Students answered scaffolding questions and reflected about root causes and connections between neighborhoods' challenges.

Considering that any map expresses a cultural form that allows for the visualization of spatial information, we view cartography as a form of narrative. Cacquard [3] conceptualizes it as "Story Maps", in direct opposition to "Grid Maps". The former relates to spatial expressions that embody individual experiences of the environment and result in a deeper understanding of places. The latter can be best exemplified by street maps, in which no personal or collective stories are embedded. In this study, we aimed to move away from regular GIS (Geographical Information Systems) and create a platform for narrative cartography.

We also looked for theories to support our hypothesis that a refined sense of spatial awareness could lead to an increased sense of empowerment. Tulloch [17] defines Public Participatory Geographical Information Systems (PPGIS) as maps derived from collective and decentralized sources of information. Parker [13] and Van Wart and Parikh [14] put forth that empowerment through PPGIS is directly connected to the acquisition of a critical spatial knowledge.

Developing a critical stance towards neighborhoods and cities is a door to civic engagement. Taylor [8] developed the concept of "locative literacies" to describe a specific type of knowing from and about spaces, or "literacies for reading and writing the city". Her work with Hall [9] encourages underserved youth to reimagine their city through the act of "counter mapping" (i.e. using maps to convey their own representation of places). Taylor and Pinkard [10] also remark that engaging youth in creating "native maps" (i.e. local and idiosyncratic representations of their communities) has the power to develop civic literacy, the knowledge necessary to actively participate in society as a citizen.

Extensive work has been conducted with digital maps and narrative cartography. For our project, we focused on initiatives such as StreetWyze [16] and Unicef's Visualizing Risk and Resilience Program [18]. Amongst their most appealing features, these platforms offer novel ways of

representing geospatial narrative data and varied methods for involving citizens in the creation of grassroots maps.

Methods

So far, our team has conducted five stages of data collection:

- 1. Exploratory Survey** – We administered an online questionnaire to 49 low SES California high school students. The questions encompassed adolescents' views and beliefs about youth empowerment and their level of awareness of local challenges.
- 2. Deep Dive Interviews** – We conducted exploratory interviews with two high school students, aimed at understanding their conceptualization of power, citizenship, and responsibilities in tackling the most pressing needs of their neighborhoods.
- 3. Participatory Design Sessions** – Inspired by Blikstein's [2] workshops with low SES students, we conducted design sessions with 11 high schoolers in East Palo Alto, California. We introduced paper maps of the school's surroundings and asked students to weave narratives about their neighborhoods' problems and potentialities. Students annotated directly onto the maps using colors, symbols, and layers of their own creation (Figures 2, 3, and 4).
- 4. Development of Digital Platform** – Based on the design sessions, we developed a mobile platform that allows maps to be populated with needs, potentialities, and calls to action. We baptized it "MyHood".
- 5. User Test and Follow-up Interviews** – We conducted user testing sessions and in-depth interviews with high schoolers, to examine their experiences with counter mapping and their resulting beliefs after using MyHood.

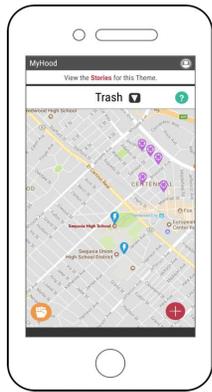


Figure 5. To push away from exclusively posting negative aspects of a neighborhood, different map pins are available.



Figure 6. Adolescents decide on which story layer (or "themes") they will work on. Note the ability to create a new theme.

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Main design considerations

Our co-creation sessions resulted in essential design considerations for developing MyHood. Below is a sample of our decisions, based on desired learning outcomes:

a. Develop spatial and systemic awareness – We

decided that maps should be the core interface over which adolescents would interact and uncover new narratives for their neighborhoods.

b. Push away from a deficit view – We created map pins for potentialities ("Powers"), problems ("Targets"), and cooperative efforts ("Calls to action") (Figure 5).

c. Collaborative learning – We transformed digital maps into a conversational platform, in which adolescents reinterpret their physical surroundings.

d. Relevance – We opened space for adolescents to define their own categories ("Themes"), respecting what they see as relevant local topics (Figure 6).

e. Reflection prompts – Inspired by human-centered design approaches, especially Design Thinking applied to schools [4], we inserted multiple spaces for reflection in the design of MyHood. We aimed to encourage empathy with residents to help adolescents go beyond what is visible (Figures 7 and 8).

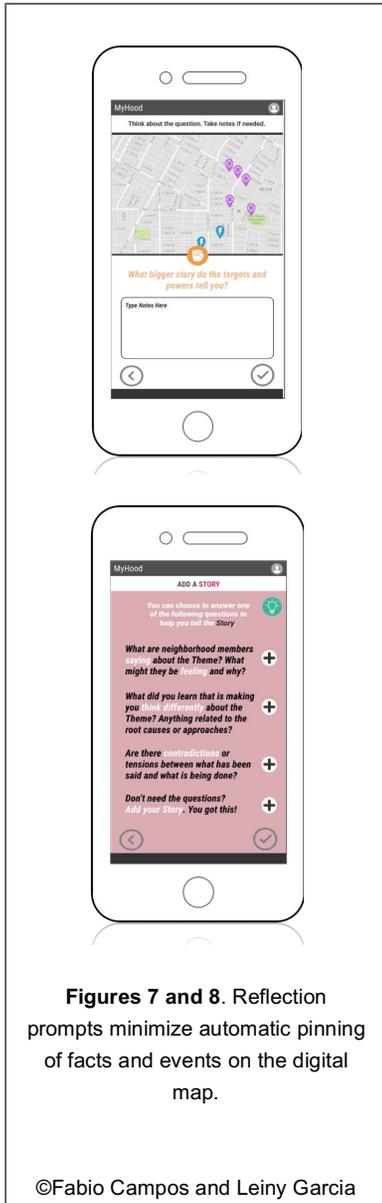
Preliminary findings

Our exploratory surveys and interviews showed that high school students are cognizant of the most pressing needs pertaining to their neighborhoods. This level of awareness, however, seemed to contrast with students' low sense of empowerment to act upon local challenges. Our results also revealed that students were offered limited chances to design solutions for their neighborhoods. This lack of opportunity to identify root causes and act to minimize their effects may have led students to believe that governments are the only entities that can make an impact on their lives.

The participatory design sessions were rich in insights and revealed common discourses among students. First, students stated that taking part in designing solutions for neighborhood needs is usually disconnected from their career goals. Conversely, we found that curricular community service activities (e.g. organizing the prom, leading study groups, etc.) are highly valued by adolescents, namely due to their direct impact on college acceptance. Some of these activities, while having both social and learning value, were not necessarily correlated with actual neighborhood needs. This seems to resonate with Kahne and Westheimer's [19] view of an individualistic and partial approach to citizen education.

The collaborative design sessions were crucial to understand students' reasoning about events, features, and stories about where they live. Adolescents tagged different themes onto a paper map of their neighborhood, allowing them to interpret crossed influences between societal and infrastructural factors. In analyzing one of their collaborative maps, students realized that, contrary to their beliefs, homelessness was not spatially tied to areas of increased violence. Their conclusion was followed by a debate about misconceptions and local representations of place. This experience materializes Soja's "Thirdspace" [15] in revealing to students the multiple layers of meaning hidden beyond physical spaces and confirms the hypothesis that the process can foster a deeper understanding of their vicinity.

After developing MyHood, our user testing sessions and in-depth interviews revealed that students showed appreciation for opportunities to discuss community matters amongst peers. However, we learned that the content previously populated on the map, such as pinned stories and events, could limit students' discussions. In other words, students were inclined to engage in preexisting themes, instead of adding new issues to the platform. This raises the question of whether students would be discouraged to seek new information or create new story



layers if they interpret the map as an exhaustive collection of facts about their locality.

One important learning relates to the motivation and interest of engaging in neighborhoods' challenges through a collective native map. While students offered positive feedbacks about MyHood, they voiced concerns regarding the likelihood of actually using it due to time constraints and school obligations. We wonder how schools could be used as a favorable environment for supervised civic engagement activities. What is more, this work led us to reflect on how schools' project-based activities – be them makerspace projects, art classes or any other community service tasks – could be transformed into assignments relevant to adolescents, impactful to neighborhoods and, ultimately, conducive to critical learning. To attain optimal results, the context of introduction and incentives for using native maps require further examination.

Conclusion

We hypothesized that maps collectively created by adolescents would result in an increased sense of agency for civic engagement and participation. We tested our theory through an exploratory survey, interviews, participatory design sessions, and user tests. We found that digital native maps [10] – local and typically unofficial representations of a place – have the power to move students from basic to critical spatial awareness and instill in them a sense of agency for civic participation. MyHood, our approach to native mapping, supported the development of locative literacies [8] by helping students "read and write" their vicinity in an augmented and idiosyncratic way. Interest, motivation, and context of use seemed to be barriers for adoption and, therefore, to the intended learning outcomes.

As education strives to advance towards student-centered approaches, it is important that students view knowledge as a tool to reorganize, reframe, and reconstruct their lived

experiences [5]. We should strive to provide learners with the means to uncover, explore, and discuss topics related to their territories as a means to engage with their communities and grow up involved in the solution of what matters most to them. If this is made a reality, learning practices will finally reflect schools' visionary mission statements.

Next Steps

As this is an ongoing project, we plan to materialize our learnings into a new iteration of MyHood. We seek to implement a variety of new features, such as the capacity to draw and annotate directly on the map, which would amplify opportunities for telling enriched stories about places.

Furthermore, we aim to conduct participatory design sessions with students from Brazil, who collaborated with our team during the exploratory stage of this work. This will bring more light into how learners change their perspectives about places and further inform the redesign of MyHood.

Our primary challenge, however, is not to launch updated versions of our tool. We aim to study how digital, collectively constructed maps can contribute to raising critical spatial awareness about students' neighborhoods and, ultimately, prepare them for adult life as participant citizens, cognizant of and ready to respond to society's needs at the local and macro levels.

Acknowledgements

This research project was supported by Stanford University's Transformative Learning Technologies Lab, the Lemann Center for Educational Entrepreneurship and Innovation in Brazil, and the TELOS fund. We also thank the developers and thought partners at Outra Coisa. Our special thanks to the students from the East Palo Alto Academy, Sequoia High School, Impact Academy of Hayward, and the NAVE Schools of Rio de Janeiro and Recife, who contributed to this study.

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