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Exploring Liberatory Makerspaces: Preliminary Results and Future Directions

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BACKGROUND

Since the mid-2000s, the U.S. maker movement has heralded the ‘democratization’ of tools and skills needed for innovation (Autodesk 2012; Cavalcanti 2013; Deloitte 2015; Dubrow 2015b; Kalil, Patel, and Miller 2014; SBS Viceland 2017; Obama White House 2014, 2016). Considering its involvement of old and new technologies (e.g., blacksmithing, 3D printing), various settings (e.g., urban, rural, educational, community), and identity groups (e.g., class, race), the maker movement is well poised to engage historically and systematically minoritized groups in engineering. However, maker communities perpetuate exclusionary practices, replicating power dynamics often seen in engineering and catering more to white, male, cisgender, heterosexual, middle-class, abled hobbyists (Chachra 2015; Foster 2017; Masters 2018; Vossoughi, Hooper, and Escudé 2016). Still, some makerspaces engage individuals who are homeless (Make: 2015), low-income (CSW 2014; Station North Tool Library n.d.), LGBTQ+ (DeCusatis, Horacek, and Harihareswara n.d.; Liberating Ourselves Locally 2012), people of color (Craddock 2015; Open Works n.d.), from rural communities (CSW 2014; Floyd CFA n.d.), and disabled (Dubrow 2015a; McGinnis 2014). This project considers how diverse makerspaces are conceived, constructed, and operated to actively involve groups traditionally minoritized in STEM.



Using participatory action research (PAR), we seek to identify practices to inform the design and implementation of makerspaces yet to achieve diversity.

Key words: Ethnography, Diversity concerns, Makerspace

METHODS

Partner Sites

PAR (Freire 1982; Maguire 1987) is the “practice of participation, engaging those who might otherwise be subjects of research... as co-researchers” (Reason and Bradbury 2008, 1). Guided by traditions of engineering and social justice (Riley 2008); citizen science (Sclove 1995); and the Highlander strain of community-based PAR (Merrifield 1989), we identified seven sites serving communities minoritized in engineering whose values aligned with maker culture: to promote shared space, materials, and knowledge to put production back in the hands of the people.

Data Collection

We employed a multi-method, three-phase qualitative study that included: (1) content analysis of makerspace websites (Weber 1990), (2) participant observations and on-site interviews (Tedlock 2003), and (3) an unconference on “Making Liberatory Spaces” in June 2018.

While being responsive to each site, a consistent protocol was used:

1. Initial contact made via trusted connections: permission/access gained through leaders at each makerspace. Access to all parts of a space and participants not guaranteed.
2. Analyzed web content to learn how each makerspace functioned and was publicly presented, and to identify ways to minimize disruptions.
3. Planned visits to capture meaningful and typical activities, as permitted by participants.
4. Following IRB protocols, researchers emphasized that individuals could decline study participation while still participating in makerspace activities.
5. To build relationships, trust, and rapport, researchers participated while observing. Informal interviews were conducted with key stakeholders at each site, drawing from established prompts.
6. Formal interviews were exclusively conducted with leaders/administrators.
7. Invited makerspace leaders/representatives to the unconference as co-researchers.

In Phase 3, 10 partner site representatives and 34 other makerspace leaders attended the unconference. Following Owen’s (n.d.) model, sessions were organized by attendees; topics included white privilege, rural environments, mental health, sustainable growth, and designing for accessibility (Masters, McNair, and Riley 2018).



PRELIMINARY RESULTS

Partner sites contrasted both demographically and in their definitions of ‘maker.’ While inclusive practices were identified (see Riley, McNair, and Masters 2017), we find it impractical — irresponsible even — to claim the existence of ‘best practices’ of inclusion; such a checklist cannot guarantee inclusion. Instead, our work emphasizes the context-specific and ever-changing nature of inclusion; to form a diverse, inclusive space, it is necessary to iteratively and intentionally listen, reflect on, and respond to the needs of one’s community.

This reality was demonstrated at the unconference, where sites compared and contrasted strategies for promoting inclusion. For example, while including people of color as makerspace founders (Riley, McNair, and Masters 2017) may serve as a promising practice for some sites, “spotlighting” (McLoughlin 2005) is damaging and context-dependent. Despite their active engagement in inclusion work, many unconference attendees were still learning the need to deconstruct bias and be intentional about inclusion. Unfortunately, the onus of facilitating deeper conversations was placed on those aware of systematic oppression, often due to personal experiences of discrimination. These attendees engaged in the emotional labor of educating others to ready the group for deeper discussions, noted as an issue in engineering by Chua (2015). Tensions arose defining inclusion with questions like, ‘Who decides what inclusion means?’ and ‘How do you identify an inclusion problem?’ These discussions reflected more conflict than consensus, indicating a need for addressing biases ahead of continued conversations.

NEXT STEPS

Data collected includes audio recordings, photos, videos, observer field notes, participant notes, setting schematics, demographics, and artifacts. Aligning with our PAR approach, next steps include the intentional, continued involvement of our partners. Future analysis will focus on the four sites with the richest engagement in the PAR process:

Site 1 - Community Science Workshop (CSW), Sanger, CA: Situated in a rural, agricultural town, CSW offers youth STEAM programming through local partnerships. Ethnographic interaction spanned 16 hours over 2 days; researchers observed school programs, meetings, and a local partner’s satellite makerspace.

Site 2 - Open Works, Baltimore, MD: Situated in a historically Black neighborhood, Open Works offers classes for all ages and provides opportunities for local economic growth. The makerspace’s staff and board include mostly people of color. Ethnographic interaction



spanned 25 hours over 4 days; researcher acted as participant-observer in classes, meetings, tours, and public recruitment.

Site 3 - Liberating Ourselves Locally (LOL), Oakland, CA: Situated in an urban neighborhood, LOL was created by and for queer, trans people of color (QTPOC). LOL is a member of a social justice collective made up of various local QTPOC-led organizations. Ethnographic interaction included 6 hours in 1 day; researchers spent time in the makerspace as well as partner-organizations' spaces acting as participant-observers in community gardening, dinner, and meeting.

Site 4 - Floyd Center for the Arts, Floyd, VA: Situated in a rural Appalachian community, the Center provides opportunities to learn and practice traditional Appalachian crafts. The Center embraces maker culture while maintaining historical and regional values. Ethnographic interaction spanned 15 hours over 2 days; researchers acted as participant-observers in blacksmithing and metal sculpture classes.

One anticipated outcome of this project is a heuristic tool designed to prompt makerspace designers/directors to consider the inclusiveness of policies and practices within their community



Figure 1. This collection of images presents highlights from data collection: (A) a STEM classroom at site 1; (B) the woodshop at site 2, which is wheelchair accessible; (C) a maker community discussion at site 3; (D) a beginners blacksmithing class at site 4; (E) author 1 kicking off the 'Unconference on Making Liberatory Spaces' by addressing the circle of attendees; (F) unconference attendees posting the sessions they will host to the agenda.



contexts. Drawing on our pre-identified list of inclusive practices and informed by thematic data analysis, practices will be converted to guiding questions; heuristics will be vetted and implemented by partner sites and advisory board members. As opposed to a classic checklist, which promotes a top-down, “fix-it” approach, this tool will emphasize reflective practice and continuous, collaborative improvement.

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