Research in Service to Practice: Equitably Consequential Making among Youth from Historically Marginalized Communities

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Objectives

In Research + Practice Partnerships with 4 makerspaces in 2 cities, we pursue equity-oriented STEM-rich making with youth from historically underrepresented backgrounds, particularly BIPOC youth and youth in refugee & low-income communities, towards developing:

- · a theory-based and data-driven framework for equitably consequential making
- a set of individual-level and program-level cases with exemplars of equitably consequential making (and the associated challenges) that can be used by researchers and practitioners for guiding the field
- an initial set of guiding principles (with indicators) for equitably consequential making in practice.

We seek to build capacity among STEM-oriented maker practitioners, researchers and youth to expand prevailing norms of making towards more transformative outcomes for youth.



Equitable & Consequential Learning & Engagement

Equitable: Robust knowledge practice development valuing & legitimizing

vouths' cultural locations & assets

towards Riahtful Making







- Movement: Ideas, resources, tools through space & time
- Geometries of power: Intersectional injustices & dynamic alliances
- Place & Place-making: Social, political & material construction across scales of activity
- Presence: Authoring rightful presence through hybrid & contentious practices

Justice-oriented Culture of Co-Making: Design Heuristic

Dimension Indicators Critical · What is learned, how, and with . Learn together through collaborative making Co-Learning Participate in distributed learning processes across people/spaces/moments Takes into consideration the wide terrain of expertise and Engage in investigatory plurality, pursue layers and related complexities epistemologies that matter to youths' reasons for making, in all its possible lavers and complexities Re-appropriate and re-mix tools and resources Surface relevant community-based and STEM-related borders for dialogue · Real & imagined geographies of making Work on, within and outside the boundaries of STEM design in makerspaces Involves making visible borders on renegotiating what counts as making, who makes, why one makes which youth are positioned, brought into proximity with STEM borders Re-make horders, both real and symbolic, visible/problematic/disrupted **Enacting** Relationalities of making involving . Transforming existing relationships and knowledge structures, with particular people, STEM and communities attention to disrupting normative boundaries of race, gender, class, and age Positions adult mentors as allies space/time, learning alongside youth . Being with (giving corporeal witness to the historical and systemic sources of around issues of injustice as impetus racism and other inequalities that underlie relationships in STEM-rich making) to engage in co-making **Futuring** . Imagine possible scenarios for what youth desire, and make in ways that orient new and re-mixed structures towards those possibilities · Requires an eye toward transformations of social-spatial Think explicitly about current predicaments realities in the longer term as a necessary co-making outcome Recognize who youth are in real time

Cultural/Community Epistemic Practices towards STEM-rich Making

In community-based making spaces, we observe culturally-based epistemic practices as integral to STEM maker work (hooks, 2009; Fairfax, 2017). These practices, when supported pedagogically by maker mentors:

"impossible" in STEM-rich making

- · enrich & transform STEM knowledge/practice,
- · support multiple iterations of design, and
- · nurture youths' identities as community STEM-makers.

Practices

- Remembrance
- Solidarity via making
- space for everyone
- · Solidarity via building
- each other up
- Resistance
- Care & Empathy

Informed by community funds of knowledge

Hope and urgency to reimagine the possible and reconsider the previously-defined

- Framed by meanings youth ascribe to maker work Framed by processes of maker knowledge production and sharing, e.g., how youth propose, justify, evaluate & legitimize maker decisions &
- Made visible by patterned set of discourses & actions with shared values, tools and meanings



Undergirded by

- Hope
- Urgency

Massaging Slipper

- · Re-purposed sole from used Timberland boot
- Hot glue crisscross pattern for massaging effect
- Pager motor for vibration
- Floral print material cover for beauty
- Wires, battery, soldering metal.

"I want to give it to the homeless and nut a motor on the bottom, so when they put it on, they could massage their feet with it. They could just kick back, and just relax. Then they can just massage their feet from walkin' all day.'

Su'Zanne: My slipper says I'm an intelligent woman. I care make things to help people who need help cause they can't get something they need or they have a problem





#StopRacism

- Recycled poster board, double plied with hot glue for durability.
- · 40 LEDs, connected by a hidden parallel circuit powered
- · hand crank generator and back up batteries

Nila made her #StopRacism sign, over many iterations, in response to her own and her peers experiences with racism. The hashtag shows people that their experiences were linked to a larger narrative, and the lighting around the double ply board so that her sign would be visible and durable. Her sign holds a prominent place in her makerspace, and is used by other peers when they want to open dialogue on racism. when they are looking for help in how to put together a complex circuit, and when they want to point out to others how much their maker work matters



Nila: "It is important to address racism because of who is the president. . . This sign could grab people's attention, like the political and rentals signs posted in front yards and along the street. My goal is to stomp it (racism) out."

Equitable & Consequential Making in Community

Incorporate tools & approaches that centralize & elevate community epistemologies

- · Tools that solicit & leverage upon insider ethnographic knowledge & practice, e.g., interviews, surveys
- · Tools that support iterative engagement in design-making in tandem with community epistemologies, e.g., Community feedback cycles, Youth-led community workshops, etc.

Create spaces for project "afterlife" as part of local maker culture

- · Role of projects in maker clubs and community settings: incorporating projects & narratives into maker discourse/culture
- · Maker projects as launching points for new projects

Supporting new models of making (co-making & justice-oriented)

- · Incorporate into maker discourse: Whom, using what resources, towards what ends
- · Critically evaluate what makes makerspace boundaries porous or not

Frame the objects of maker learning along three interacting scales:

- STEM/maker knowledge and practice (including hybrid forms)
- Maker projects themselves
- · Shifts in discourses/practices which elevate community voices, including incorporation of community epistemologies

Participatory methodologies for maker teaching, learning, sharing, and















