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STEM JUSTICE:

How can renaming and reclaiming theory and research methods foster relevance and equity in participatory research projects?

2019 AISL PI Meeting

OUR CO-PI TEAM

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STEM Justice

A movement to redefine STEM as a tool for addressing systems of oppression (KAYSC definition)

KAYSC

Kitty Andersen Youth Science Center:

- empowering youth to change the world through science
- based at the Science Museum of Minnesota
- pathway program focusing on girls, youth of color or indigenous youth, and youth from low-income families

www.smm.org/kaysc

OUR QUESTION

grows out of

- theory-practice divides
- a need to address multiple audiences: practitioners, researchers, theorists, the ISE field
- our design iterations of the STEM Justice model
- our work to honor cultural differences among youth, practitioners, managers, and researchers
- navigating tensions in our Research Practice Partnership as we try to produce knowledge differently while honoring multiple ontological and epistemological ways of being.



Youth Research Team presenting at a conference, February 2019



STEM Justice Co-Design Team working with external partner Youth Farm, December 2018

RECLAIMING SCIENCE

“The history of science is, in part, the story of its struggles with other ways of knowing” (Medin & Bang, 2014, p. 15). We work to challenge Western-dominated conceptions of science through questions and practices that look to other global conceptions of science and to **reclaim silenced sciences**.

So, we ask:
How do we navigate multiple cultural worlds?

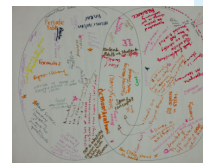


KAYSC families at March for Science-Kids Climate March, St. Paul, MN, April 2017

RECLAIMING/RENAMING METHODS

We are using “**embedded research practices**” (McManimon, forthcoming) for data generation such as

- rotating paired conversations
- “What, Gut, So What, Now What?” reflection tool
- practitioner data coding
- pedagogical activities.



Youth/adult Venn diagram brainstorm on science in the KAYSC and school, February 2018

- “Embedded research practices”
- echo ISE embedded assessment
- emphasize research and practice interaction
- are emergent
- serve practitioners’ needs, including facilitation skills and professional development.

So we ask:
How do we design, implement, and analyze embedded research practices?
How can research methods also serve the practitioner need to reflect on practice?



New KAYSC high school crew members with their crew managers, December 2018

RECLAIMING RESEARCH

Embedded research practices and outcomes challenge traditional research hierarchies as well as **center theory and research as learning tools useful in practice** (see, e.g., Bang & Vossoughi, 2016).

So, we ask:
How do we center equity and social justice?
*How do we ensure that our research is **with and not on**?*

RENAMING THEORY

Science capital
(Archer et al., 2015)

what you know, how you think, what you do, who you know

science capitxl
(STEM Justice research project)



KAYSC high school youth teaching others

- We renamed theory to
- better signal the theory’s roots in equity and social justice
 - demonstrate the power of language and its unpacking
 - invite questioning
 - document opposition to systemic oppression
 - serve practitioners and academics.

“Science capitxl”:
a **practical and pedagogical tool** for reflecting on how ISE programming embeds science dispositions, practices, and knowledges in the service of social justice.

So, we ask:
How do we adapt theory for our own settings?

REFERENCES

Archer, L., Dawson, E., DeWitt, J., Seakins, A., & Wong, B. (2015). “Science capital”: A conceptual, methodological, and empirical argument for extending Bourdieusian notions of capital beyond the arts. *Journal of Research in Science Teaching*, 52, 922-948.

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Demonstration at Youth Science Day