Partnering for Equitable STEM Pathways for Youth Underrepresented in STEM (YeSTEM)

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Research Team

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Partnerships

London
- UCL
- Brent Lodge
- STEMettes

Bristol
- UCL
- @Bristol
- KWMC

Lansing
- MSU
- Impression 5
- Boys & Girls Club

Portland
- Institute for Learning Innovation
- OMSI
- Girls, Inc.
Responding to three shared challenges:

1. Lack of shared understanding of how youth from historically underrepresented backgrounds perceive and experience ISL opportunities across national contexts, and the practices and tools needed to support empowered movement through ISL

2. Limited shared understanding and evidence of core high-leverage practices that support such youth in progressing within and across ISL

3. Limited understanding of how ISL might be *equitable* and *transformative* for such youth seeking to develop their own pathways into and through STEM
Core strands

- **Strand 1: Youth Pathway Portfolios (Years 1 and 2)**
  - Local and x-site pathway representations
- **Strand 2: Practitioner High Leverage Practices Portfolios**
  - Local and x-site HLPs
  - Linking Youth Portfolios with HLPs
  - Creating an initial model of Equity-oriented HLPs/Pathways
- **Strand 3: Designing and testing new ideas for equity-oriented high leverage practices within and across sites**
  - Developing tools to support practices
  - Local and x-site testing of tools/practices
  - Refining tools and practices
  - Refining model
- **Strand 4: Dissemination**
Theoretical frameworks

- **Interest Development** – Interest is the product of the interaction of a person with their environment, always with the possibility to develop. (Renninger & Hidi, 2016; Hidi & Renninger, 2006)

- **Science Capital** – STEM-related cultural and social resources (e.g. knowledge, attitudes, experiences, networks) that youth possess, but may or may not be valued or recognized in a given context. Building on Bourdieu’s work. (Archer, Dawson, DeWitt, Seakins, & Wong, 2015)

- **Learning Ecosystem & Mobilities of Learning** – Frameworks that highlight 1) the set of contexts that support learning across settings and 2) how youth navigate pathways towards STEM. (NRC, 2009; Traphagan & Traill, 2014; Falk & Dierking et al., 2016; Calabrese Barton & Tan, in press)
Our commitments

• **Equity** – we will produce new knowledge and practices to close the gaps in STEM.

• **Participatory and collaborative approaches** – the voices of youth and practitioners are central to re-imagining ISL knowledge and practices in new ways.

• **Contribute to learning and development theory and empirical understandings of how STEM pathways work** for minoritized youth
ISL and equity pathways

• How youth move through ISL and its cumulative impact
• How equity pathways matter in very real ways to youth & why we need to see them from different perspectives

“No one-off event is going to cut it in terms of making real impact on social inequalities and widen science engagement. The appeal of the pathways model is that it means no one person or organisation has to try to do it all.” (UK practitioner, phase 1 workshop)
Research Questions (Strand 1)

• How do youth from communities under-represented in STEM experience and describe ISL activities? What factors seem to shape those experiences in ways that make them equitable (or not)?

• In what ways, and under what conditions are under-served youth supported in connecting ISL experiences to build their equitable and transformative STEM pathways? What makes pathway development successful (or not) and with what outcomes (e.g. content, practices, agency, identity)?

• What tools, resources and strategies can practitioners (and youth themselves) use to aid successful youth path-making in and through STEM?
Youth Portfolio Data
Portland, OR
Youth Researchers
Youth Researchers

Girls, Inc.

- Interest timelines
- STEM identity reflection: five years ago, now, ten years from now
- “Final” project to share ideas about STEM pathways (with other youth who may want to forge such a pathway and for practitioners supporting youth): what do they need to know, try, look out for

OMSI

- Interest timelines
- Personal Meaning Mapping (“ME” “STEM”)
- “Final” project to share ideas about STE(A)M, pathways, or interests: Why STEAM, how did they become interested, why did they choose such a topic for a school science project, what was it like to attend a STEAM school?
Personal Meaning Mapping

STEM

FEARLESS IS GIVING IT YOUR BEST SHOT

PORTLAND

What I like to do is play basketball and play football. I am 13 years old and I like to cook on my first time when I'm not doing anything. I like to watch movies, and go to the mall. I like to travel to your place like going to Seattle, California, and other places. My favorite place to go is this place in California. I play basketball and I'm known as basketball. I'm 13 years old. I'm African American. Youngest child.

STEAM

2 siblings

Jan 1st

Birthday

Artist

MUSICAL FASHION

Funny

African American

Dancer

Smart

EQUALITY

FEEDOM
My relationship with STEM has changed over the years. In middle school, I took a science class. I worked hard and was invested in what I was doing. My classmates were not very supportive, causing me to feel unimportant. However, I continued to do well in my classes. I enjoyed learning about science, and I wanted to learn more. I was always interested in science, but I was not sure what it was that I wanted to learn. I was interested in biology, and I wanted to learn more about it. In high school, I took a biology class and was able to learn more about the subject. I enjoyed learning about the different organisms and the processes that occur in them. I also enjoyed learning about the different ways that organisms can be classified. In college, I took a physics class and was able to learn more about the principles of physics. I enjoyed learning about the different forces that act on objects and how they affect their motion. I also enjoyed learning about the different ways that motion can be measured. I have always been interested in science, and I enjoyed learning more about the different topics. I hope to continue learning about science in the future and to find new topics to explore.
Next Steps

• Project researchers and practitioners discuss youth portfolio data and emerging themes highlighted by youth about their experiences.

• Based on these discussions, identify High-Leverage Practices (HLPs) for each context. Conduct design-based research by using HLPs in each context in the US and UK, and iterate. (Year 3)

• Engage in cross-site comparisons (within the US and UK, and between the US and UK).
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Micaela Balzer (Impression 5)
Marcie Bennie (Oregon Mus of Sci & Industry)
Carolyn Manke (Girls Inc., Pacific Northwest)
Sample Title
Sample Title

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