

# Designing Learning Environments that Promote Equity and Inclusion

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# Informal Innovative Learning Environments (makerspaces, ispaces, co-working spaces, innovation labs, fablabs)



# Transdisciplinary Team

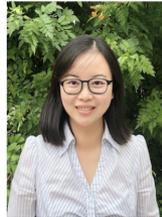
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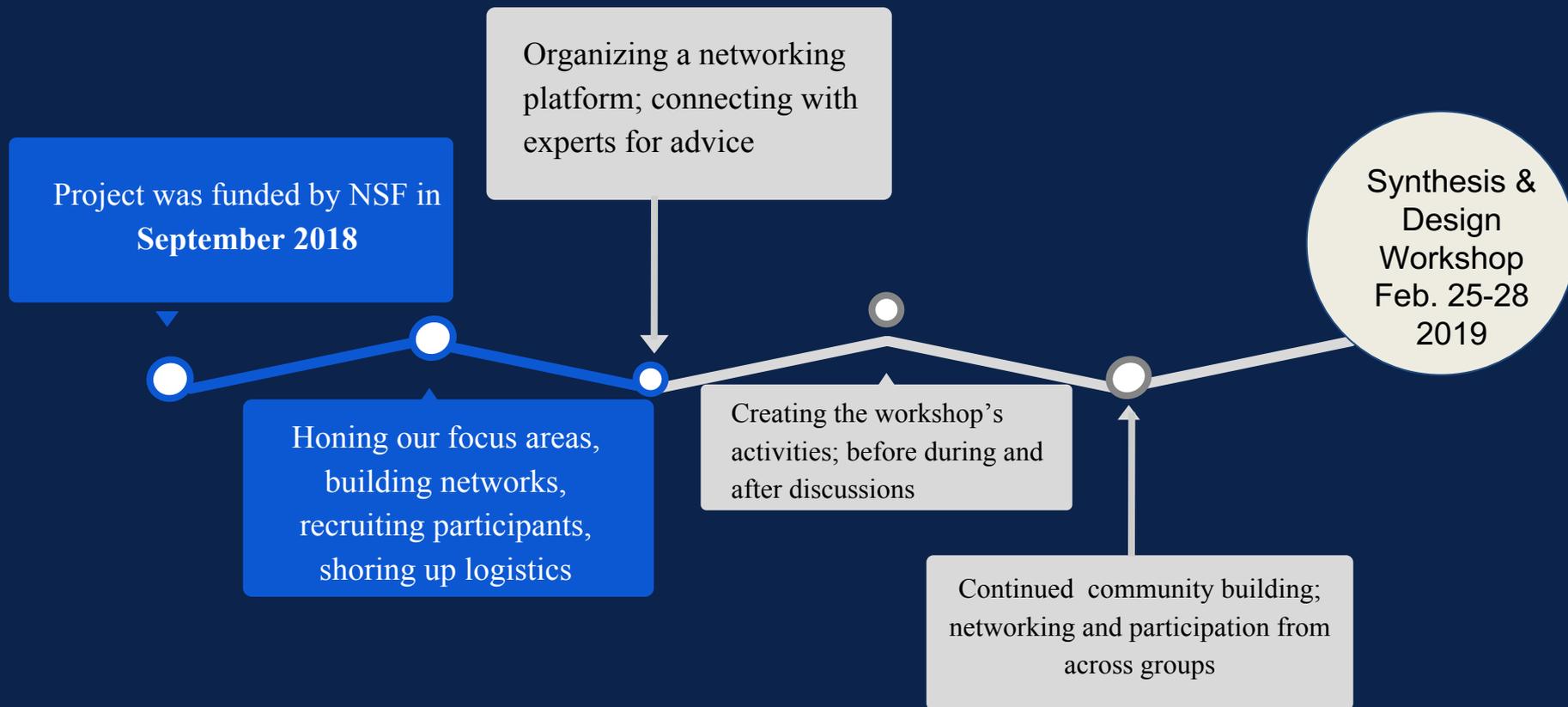
## University of Arizona STEM Learning Center

## University of Arizona Office of Digital Learning

# We are at the initial stages of our work



National Science Foundation  
WHERE DISCOVERIES BEGIN



# We are in the midst of three efforts

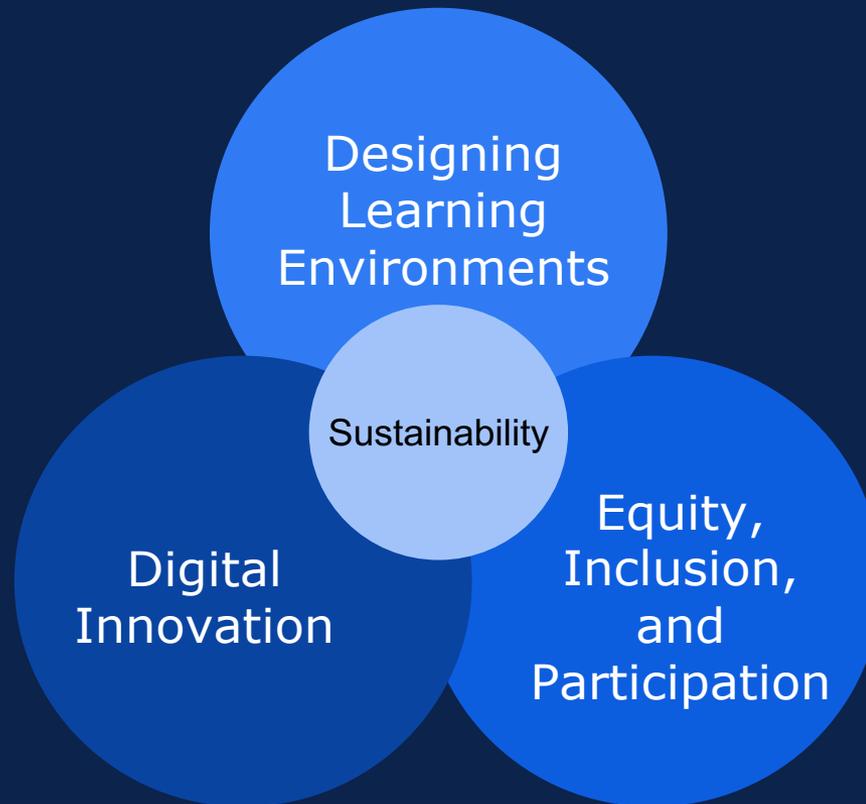
Student  
Success  
District

Digital  
Innovation  
and  
Learning  
Lab  
(DIALL)

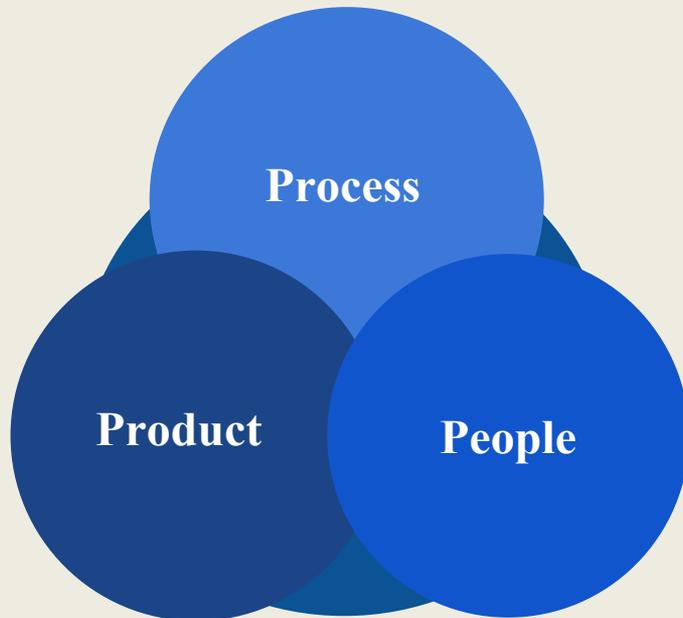


Principles for the equitable  
design of digitally-distributed,  
studio-based STEM learning  
environments (funded by NSF)

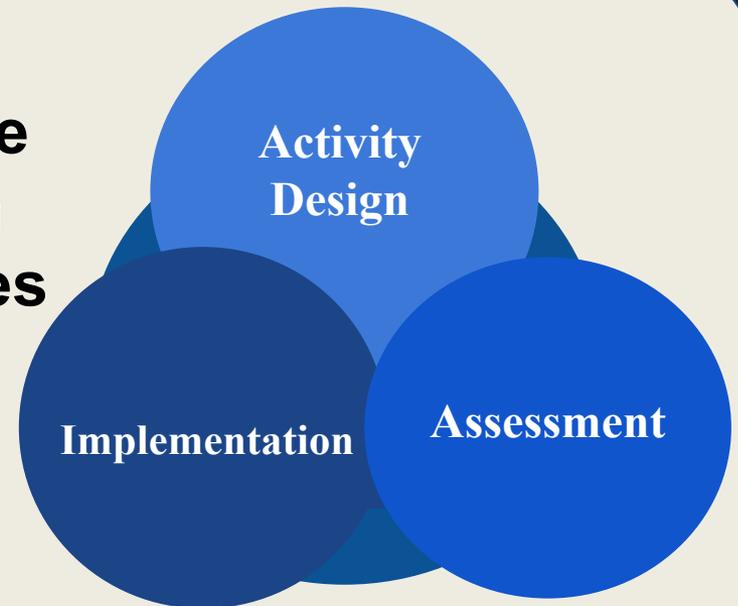
# We're asking questions centered at the intersection of...



# How do we connect design principles to outcomes to examine to what extent we are meeting our inclusion & equity goals?



**Inclusive  
Design  
Principles**



**Learning Environment Design Considerations**

# Questions we may ask

- Who often partakes of these learning spaces?
- Do these spaces draw in diverse participants in an equitable and inclusive way? If not, why not?
- How can technology networks and digital tools be used to facilitate the community?

## The Challenge: Creating inclusive learning spaces that invite multiple perspectives and full participation

- Although the practices associated with making have deep roots across cultures and genders, many makerspaces are struggling to overcome a narrow economic view of who makers are and what makers do (Vossoughi, Hooper, & Escude, 2016; Barton & Tan, 2018).
  - A 2017 survey of youth focused makerspaces conducted by Peppler, Keune, Xia, & Chang showed that: “While overall makerspaces seem to be continuing to **serve diverse populations in terms of ability, age, and gender**, the race of youth participants in the US sites in 2017 is significantly less diverse compared with that of participants in the 2014 survey.”
  - Sustainable programs for diversifying access to learning environments require us to identify and address existing barriers to participation.
- 

# The Challenge: Creating inclusive learning spaces that invite multiple perspectives and full participation

- The Invention Studio (Noel, Murphy, Jariwala, 2016) observed four main barriers: anxiety due to lack of experience, a lack of information regarding equipment and usage, a fear of alienation, and a pre-existing notion that makerspaces are only for engineering.
- Must make the time and space to ask questions related to inequities (“Who has access to more complex activities? Who is using what tools? Are multiple approaches and pathways supported or marginalized?, etc.)
- Incorporate equity through purposeful and thoughtful design (Open access to tools, thoughtful organization, etc.)

Bevan, B., Ryoo, J., & Shea, M. (2017); Vossoughi, S., Hooper, P. K., & Escudé, M. (2016)

# February 25-28, 2019 Synthesis and Design Workshop

## University of Arizona Biosphere 2



- Innovative ideas
- Challenges and opportunities



- interdisciplinary
- Connecting expertise



- Different modes of learning
- envision, propose, implement



National Science Foundation  
WHERE DISCOVERIES BEGIN

# February 25-28, 2019

## University of Arizona Biosphere 2

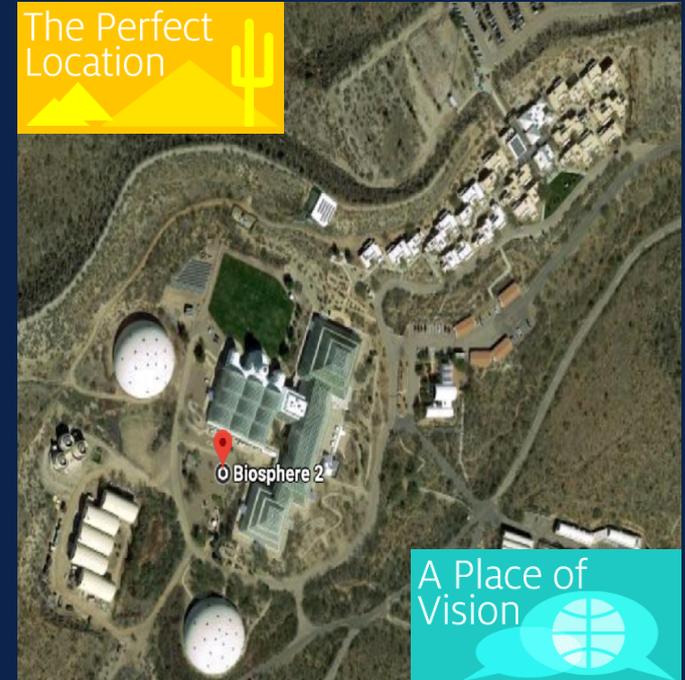
- Iconic setting for formal and informal collaboration.
- World-renowned innovative center for scientific research.
- Far-reaching provider of public education.

Retreat & Conference facilities

Casita Village = 28 modern, multi-room apartments

Overnight capacity for up to 200 individuals

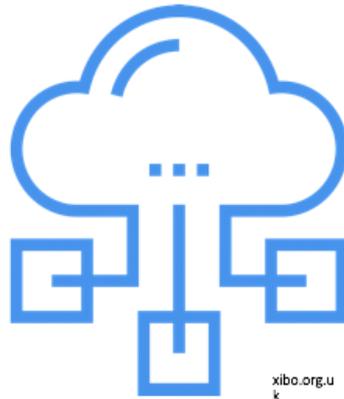
Variety of meeting spaces



# Studio Maker Space



Milwaukee  
Makerspace



xibo.org.uk

**Digital  
Connectivity**

**Enhanced Access**



www.pdx.edu/dr/c/

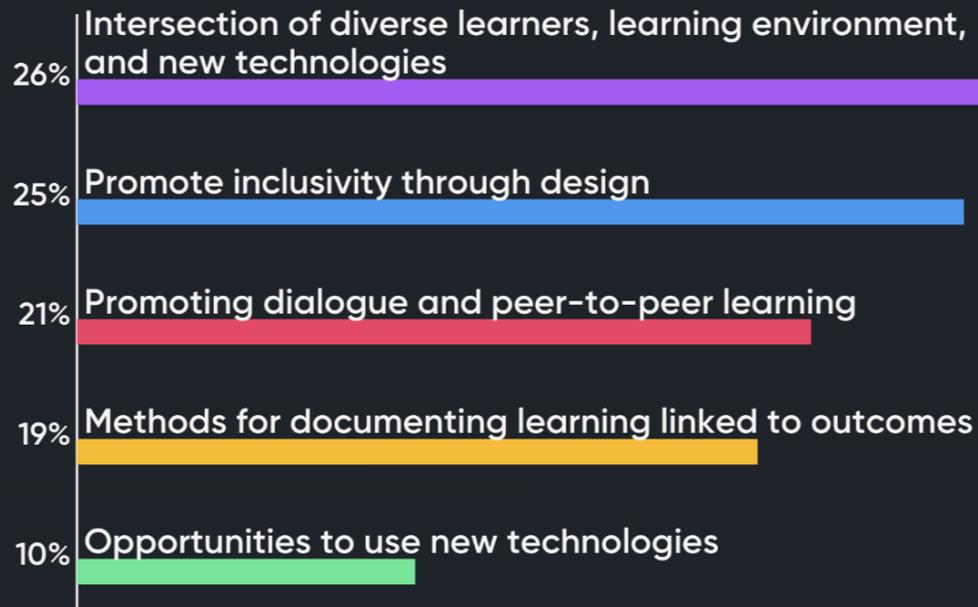
**Diverse  
Perspectives**

***Five overarching tracks** that address critical questions for designing learning environments optimally for equity and inclusion*

- design principles and practices that **promote the inclusivity of learning spaces**
- **methods for documenting learning** in ways that are linked to outcomes and impacts for all learners
- opportunities to **use new technologies in diverse settings** for diverse purposes
- structures and tools for facilitating and promoting **dialogue and peer-to-peer learning**
- design features that **maximize the intersection between diverse learners, the learning environment, and new technologies**

# Interactive Poll

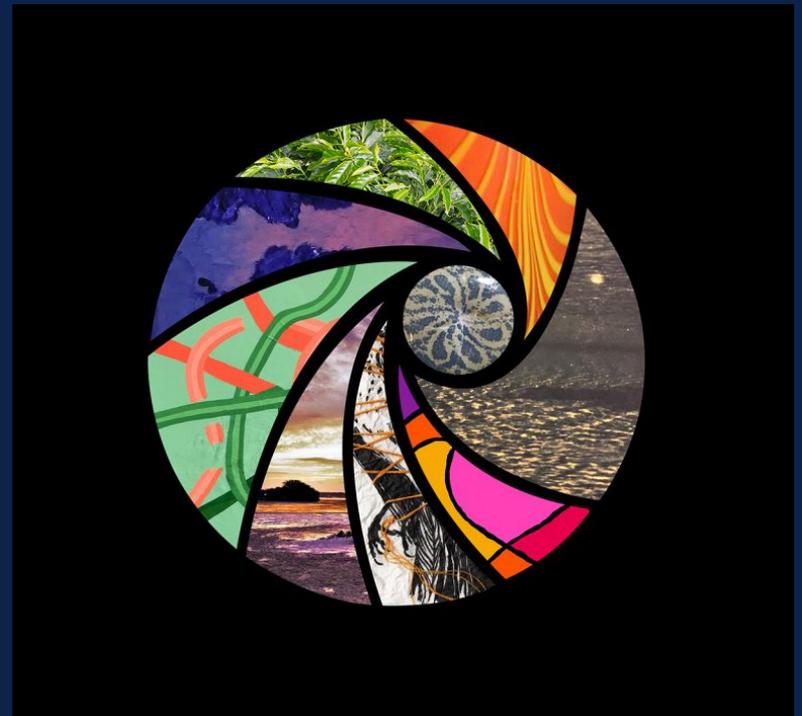
## Weigh in on focus areas for the equitable design of makerspaces





# Multidisciplinary groups and perspectives to examine and help address these issues

- Community groups
- Libraries
- Non-Profits
- Organizers
- K-12 Schools
- University Researchers
- Practitioners
- Designers
- Museums



# What Do Researchers, Educators, Architects and Policy Makers Gain from these efforts?



- Create a targeted focus on equity, inclusion, participation, and diversity as a core value
- Grow sustainable partnerships around common interests that will grow and develop

# For additional information or to participate in the workshop, Contact Our Team

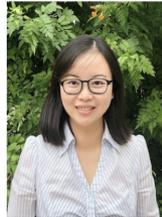
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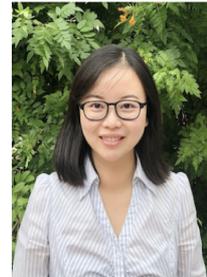
University of Arizona  
STEM Learning Center

University of Arizona  
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**Thank you! Let's continue the dialogue and discussions  
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