

Welcome to the NGCP National Webinar

***Equity in STEM Education:
The Connection to Culture***

May 27, 2020

NATIONAL GIRLS COLLABORATIVE PROJECT



Vision

The National Girls Collaborative Project **brings together organizations** committed to informing and encouraging girls to pursue careers in science, technology, engineering, and mathematics (STEM).



NGCP Goals

1. **Maximize access** to shared resources within organizations interested in engaging girls in STEM.
2. **Strengthen the capacity** of programs by sharing exemplary practice research and program models.
3. **Use the leverage of a network** to achieve gender equity in STEM.



NGCP Activities

Virtually:

- Distribution and Content Projects
- ***The Connectory – Collaboration Tool***
- ***FabFems – Role Model Tool***
- E-Newsletter and Social Media
- Webinars – *Exemplary Practices*

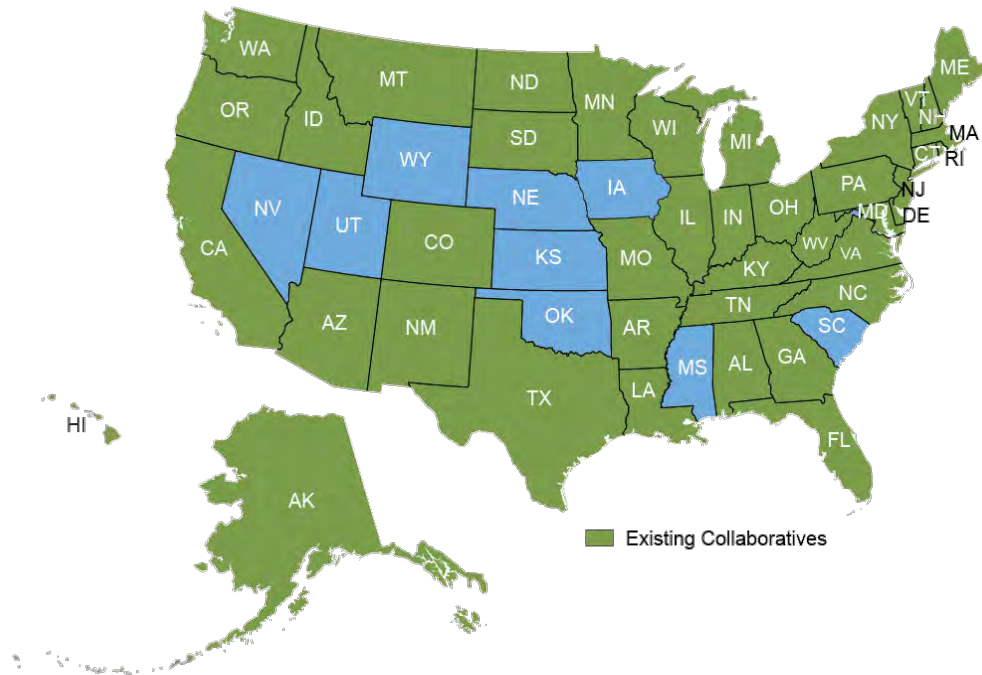


Local Collaboratives:

- Professional Development: *Conferences and Forums*
- Incentives to Collaborate: *Mini-Grants*
- Newsletters and Local Resources



National Network of Collaborative Teams



SciGirls

scigirlsconnect.org
pbskids.org/scigirls

SciGirls is an Emmy Award-winning PBS Kids show funded by the NSF that

- Features *real* girls doing STEM investigations they're passionate about;
- Highlights science and engineering processes;
- Features *real* female STEM professionals as role models and mentors



Rationale

Why do we still care about girls and STEM?

- Boys and girls do not display a significant difference in their **abilities** in STEM. The cause is social and environmental.
- Differences consistently appear in girls' **interest** and **confidence** in STEM subjects, starting at a very young age.
- These differences can be linked to a **negative self-perception**, enhanced by stereotypes.



The *SciGirls* Approach

On TV

- National PBS Kids series – Seasons 1-5 are airing now Season 6 in is production (funded by NASA)

Online

- A PBS Kids website with videos, games and role model profiles (pbskids.org/scigirls) and on the PBS Kids Video App

On the Ground

- STEM activities and professional development for 200+ partners and 3,600 trained educators, and hundreds of *SciGirls*-affiliated role models on *FabFems*.

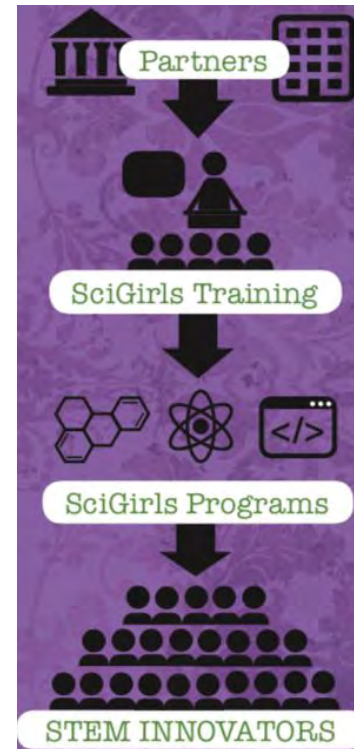
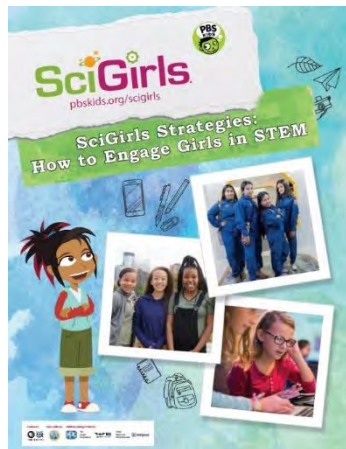


SciGirls Research to Practice Model

- *SciGirls* uses **research-based strategies** proven to engage girls in STEM to create media + outreach programs
- Five PBS seasons feature STEM role models working with real girls on **meaningful STEM projects**
- ***SciGirls CONNECT*** has trained over 3,600 educators in gender equitable teaching strategies, resulting in more than 1,600 youth programs for 101,000 girls (and boys!)



SciGirls Research to Practice Model



SciGirls Strategies: How to Engage Girls in STEM

The **SciGirls** approach is rooted in research about how to engage girls in STEM. A quarter of a century of studies have converged on a set of strategies that work, and they have become the framework for **SciGirls**.

- 1 **Connect STEM experiences to girls' lives.**
- 2 **Support girls using STEM practices.**
- 3 **Empower girls to embrace struggles.**
- 4 **Encourage girls to challenge STEM stereotypes.**
- 5 **Emphasize that STEM is collaborative and community-oriented.**
- 6 **Interact with diverse STEM role models & mentors.**

Our approach is grounded in research-based strategies that motivate girls around STEM engagement and include:

Framework for the SciGirls Strategies

In order to be effective at implementing the **SciGirls Strategies**, educators need to:

Provide an inclusive learning environment.

TIPS:

- ★ Create a warm and welcoming space that is accessible to all.
- ★ Create an atmosphere of mutual respect.
- ★ Use icebreakers so youth can introduce themselves in a non-threatening manner.
- ★ Provide opportunities for youth to voice their opinions.

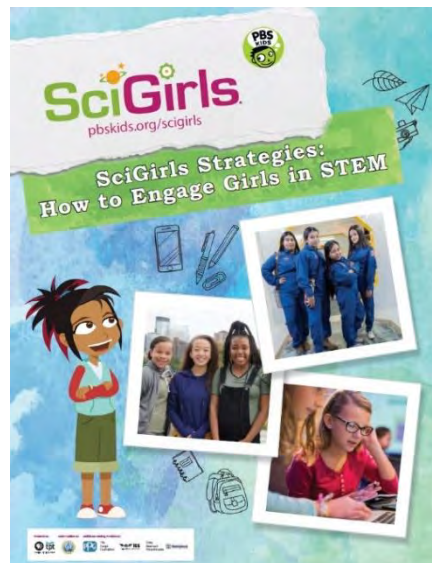
Use culturally responsive teaching practices.

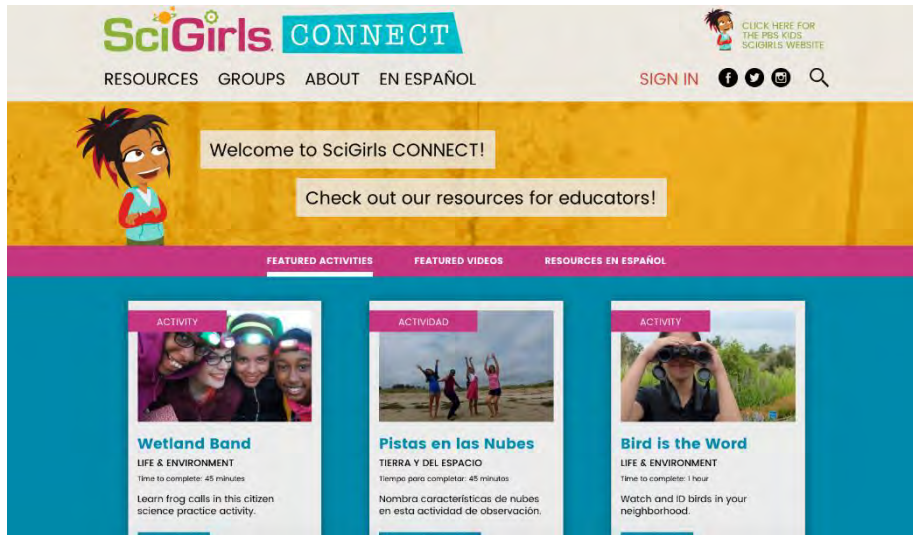
TIPS:

- ★ Understand your culture and how it affects others.
- ★ Get to know your youth and build on their life experiences.
- ★ Communicate high expectations for behavior and performance.
- ★ Validate youth's bilingual abilities to leverage learning.

www.scigirlsconnect.org

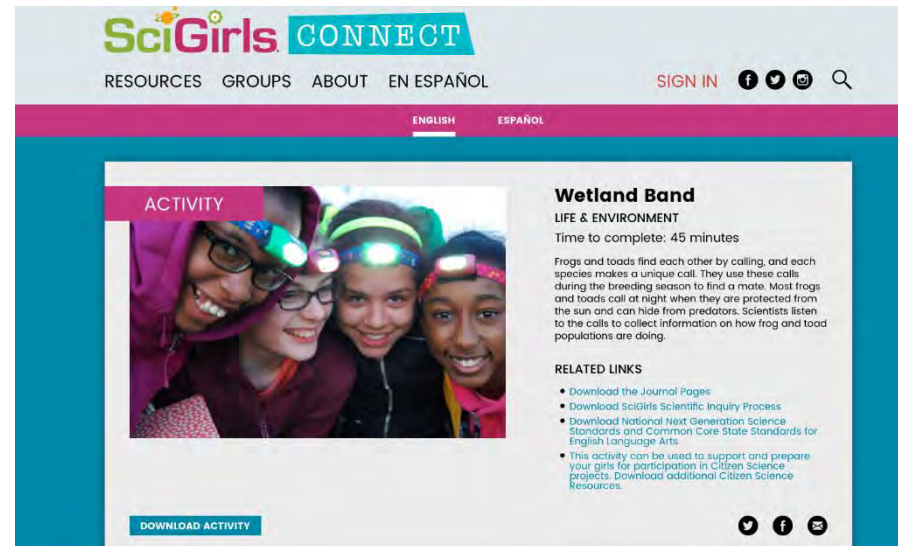
Produced By:





scigirlsconnect.org

Download videos, activities, and other resources to enhance your program!



Equity in STEM Education: The Connection to Culture



Culture is central to student teaching and learning

Have you thought about how your culture impacts the way you teach, and the way students engage in STEM learning?

Culture...

- Shapes our everyday life, how we see the world, communicate and interact with each other
- Plays a key role in communicating and receiving information

My Culture...

- Is represented in who I am and who I am as an educator
- Shapes the way I view things and the way I teach



Diversity in the learning environment

How is cultural diversity reflected in your programs?

- Diversity is the norm in most out-of-school programs.
- Teaching in multicultural environments leads to challenges AND opportunities!
- How can educators effectively engage students from diverse backgrounds?



Culturally responsive practices

- A **culturally responsive educator** has the knowledge, attitudes, and skills to communicate and work with diverse students.
- Geneva Gay defines **culturally responsive teaching** as “a process of using cultural knowledge, prior experiences, and performance styles of diverse students to make learning more appropriate and effective for them”. Gay, Geneva, 2013 "Teaching to and through cultural diversity."



Engaging students in culturally responsive and appropriate ways

- **Create a *STEM for All learning environment*.** Create an inclusive learning environment that looks and feel inviting and allows students to feel that they belong. Tips:
 - ✓ Create a welcoming space that is accessible to all and fosters cooperation and acceptance; a space where students can work in a collaborative way.
 - ✓ Create an atmosphere of mutual respect. Shared expectations help develop a sense of community and encourage positive interactions.
 - ✓ Provide opportunities for students to voice their opinions and feel accepted.



For more information go to scigirlsconnect.org

Engaging students in culturally responsive and appropriate ways

- **Develop genuine and trusting relationships and validate students' strengths and interests.** Get to know your students as individuals and learn about their culture. Use icebreakers or short activities to find out their interests and the way they operate at home and in their community.
- **Learn...listen, observe, understand your own culture and how it is affecting the way you relate to students.**
- **Become aware of your own values, assumptions and beliefs (implicit biases).**





Resources

- Gay, Geneva. "Teaching to and through cultural diversity." *Curriculum Inquiry* 43.1 (2013): 48-70.
<https://www.wou.edu/~kaguzman11/curi12002.pdf>
- National Center for Cultural Competence. Georgetown University. Selected characteristics along the cultural competence continuum.
<https://webcache.googleusercontent.com/search?q=cache:N3KQN2nVBqoJ:https://nccc.georgetown.edu/curricula/documents/TheContinuumRevised.doc+&cd=12&hl=en&ct=clnk&gl=us>
- National Education Association. Diversity toolkit: cultural competence for educators. <http://www.nea.org/tools/30402.htm>
- National Education Association. Promoting educators' cultural competence to better serve culturally diverse students. A NEA policy brief.
http://www.nea.org/assets/docs/PB13_CulturalCompetence08.pdf

Resources

- SciGirls Strategies: How to Engage Girls in STEM.
<http://www.scigirlsconnect.org/wp-content/uploads/2019/06/SciGirls-Strategies-Guide.pdf>
- Student Centered and Personally Relevant Learning. *SciGirls*.
<https://www.youtube.com/watch?v=4w5VokuvYYg>
- Culturally Responsive Teaching. *SciGirls*.
<https://www.youtube.com/watch?v=Y22JGwU1Upc>
- Santiago, A. (2020, March 4). Equity in STEM Education: It's all about culture! NSTA Blog.
<http://blog.nsta.org/2020/03/04/equity-in-stem-education-its-all-about-culture/>
- 3 Tips to Make Any Lesson More Culturally Responsive.
<https://www.cultofpedagogy.com/culturally-responsive-teaching-strategies/>

A NETWORKED COMMUNITY.

We are an interdisciplinary community of educators and researchers who are firmly committed to making schools places where all students want to be and want to learn.

weareis scholar.org

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Tamika McElveen



WORKING PD SESSIONS

**COMMUNALLY-ORIENTED
STEM ACTIVITIES**

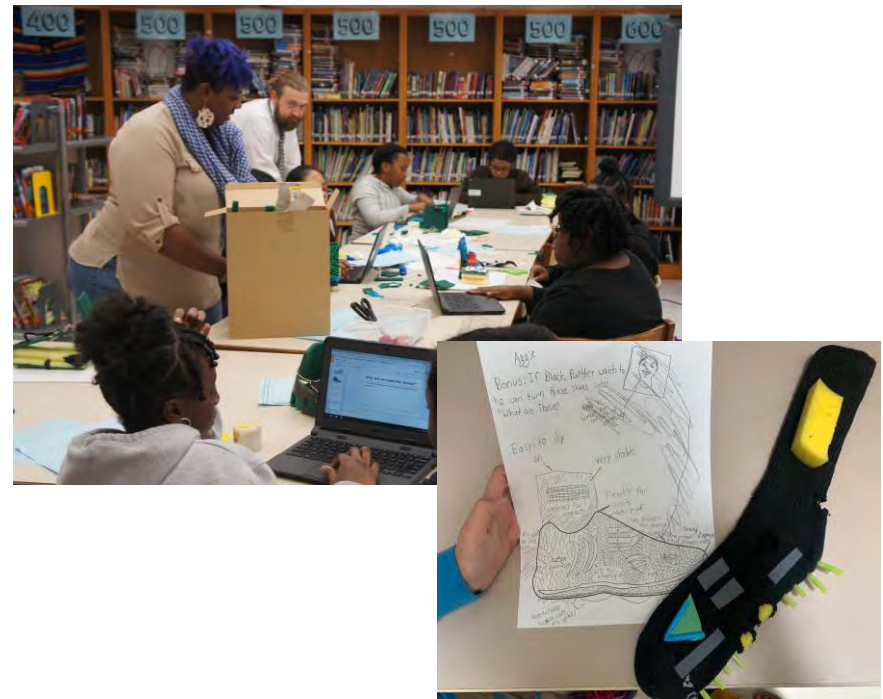
**CULTURALLY-SENSITIVE
RESEARCH METHODS**

Communal Lessons for the Daily Wins

Relevant Design Challenges



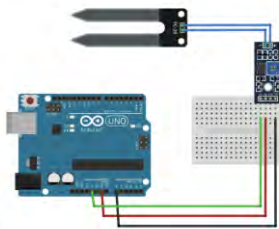
Research Component - Encouraging Students to Research and Prototype-Building



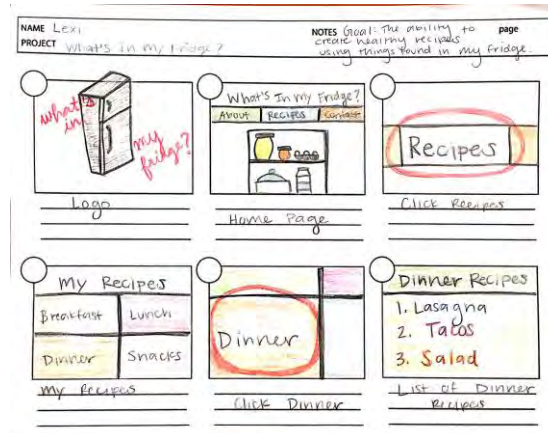
Communal Lessons for Daily Wins

Create your Resources (Worksheets, Cards, Models, Etc.)

Sharing Knowledge with Community



Wire A - 5V
Wire B - GND
Wire C - A0



Ashanti Tribe

The Ashanti tribe is located in the central Ghana of west Africa. Within this region, the Ashantis are among one of the more powerful tribes.



They are known for their pottery, wood carving, metal casting, and especially weaving. Weaving is such an honored task, that only men are allowed to weave, where as women in the tribe are trusted to prepare the material to be woven.





Levels of Culture

Surface Culture

Observable Patterns

Low emotional impact on Trust

Food-Holidays-Clothes-Hair-Language-Art

Shallow Culture

Unspoken Rules

High emotional impact on Trust

Personal Space-Eye Contact-Concepts of Time

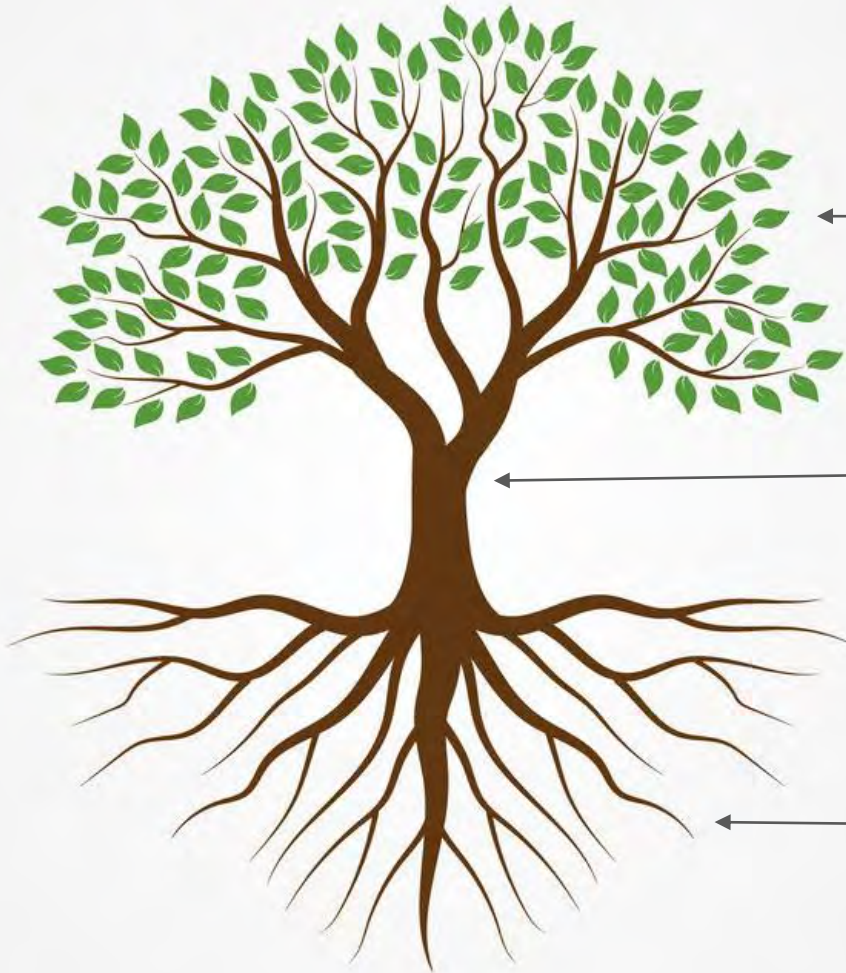
Deep Culture

Collective Unconscious Beliefs & Norms

Intense Emotional Impact on Trust

Decision Making-World View-Spirituality-Communalism

Hammond, 2015, p.24

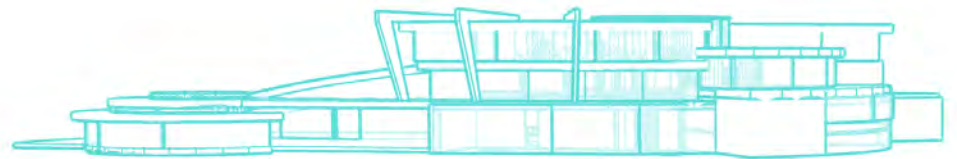
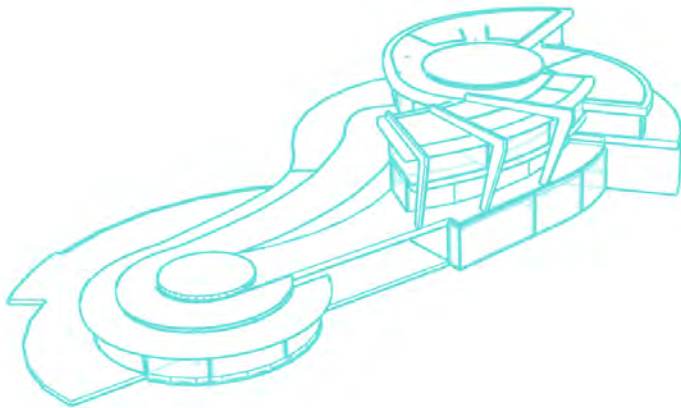
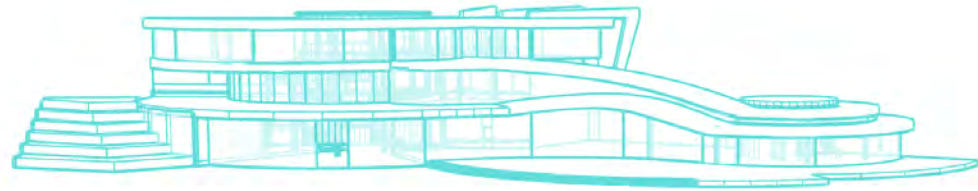
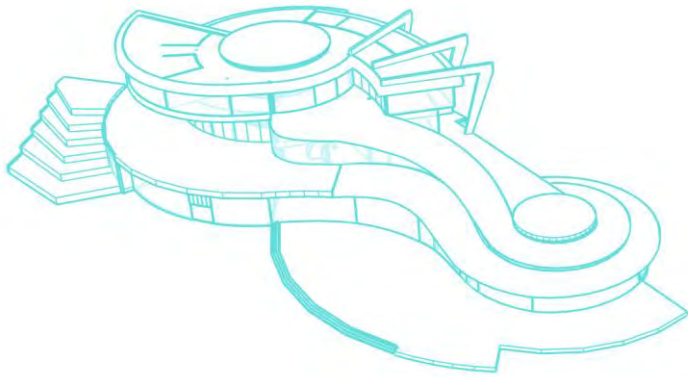


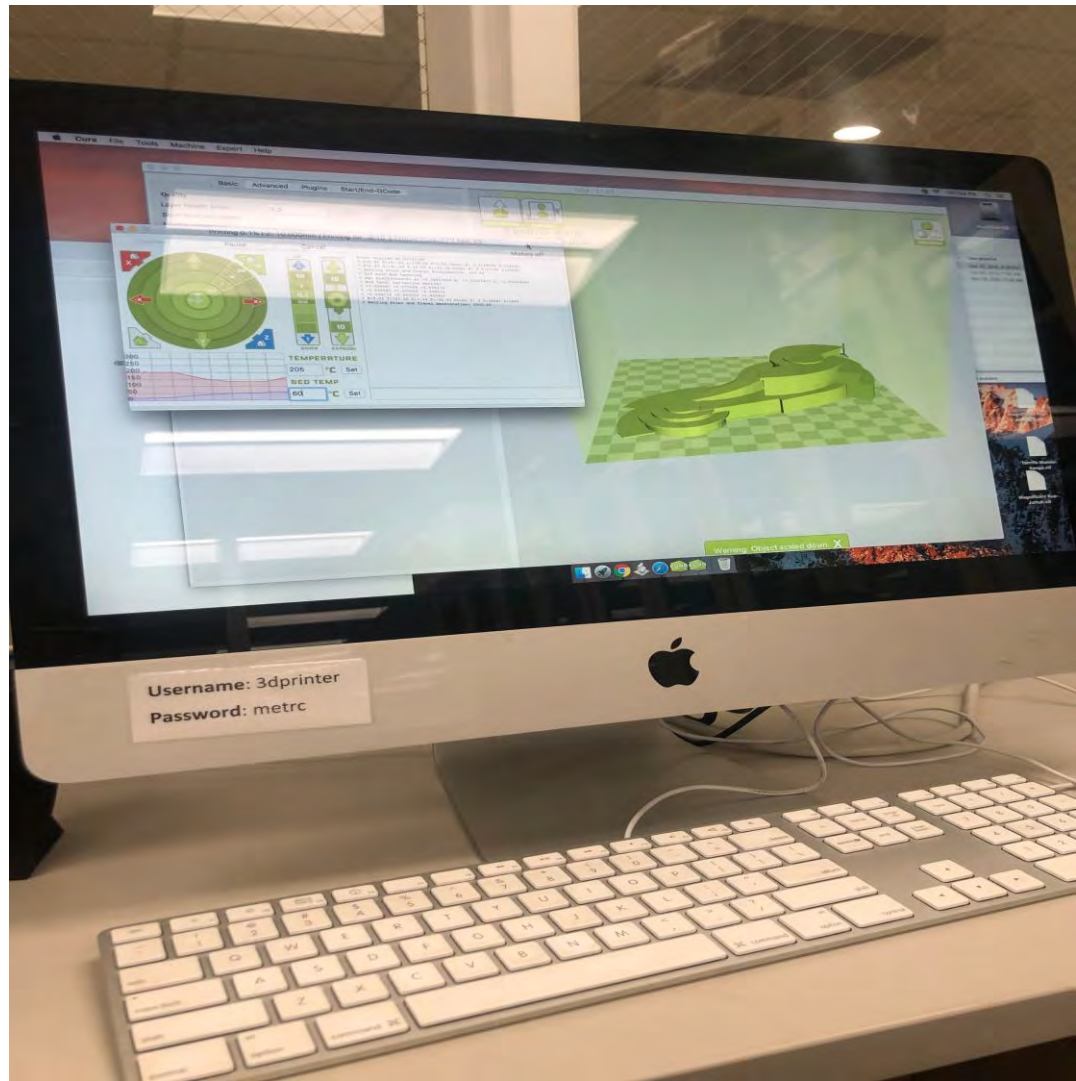
Why communalism?

Self-direction	Achievement	Power	Tradition	Benevolence	Universalism
Curious	Success	Social power	Respect for tradition	Helpful	Protecting the environment/Unity with nature
Creativity	Capable	Authority	Humble	Honest	Broad-minded
Freedom	Ambitious	Wealth	Obedient	Forgiving	Social Justice
Choosing own goals	Influential	Preserving my public image	Honoring of parents and elders	Loyal	Wisdom
Independent	Intelligent	Social recognition	Self-discipline	Responsible	Equality
Self-respect			Politeness	A spiritual life	A world at peace
				True friendship	Inner harmony







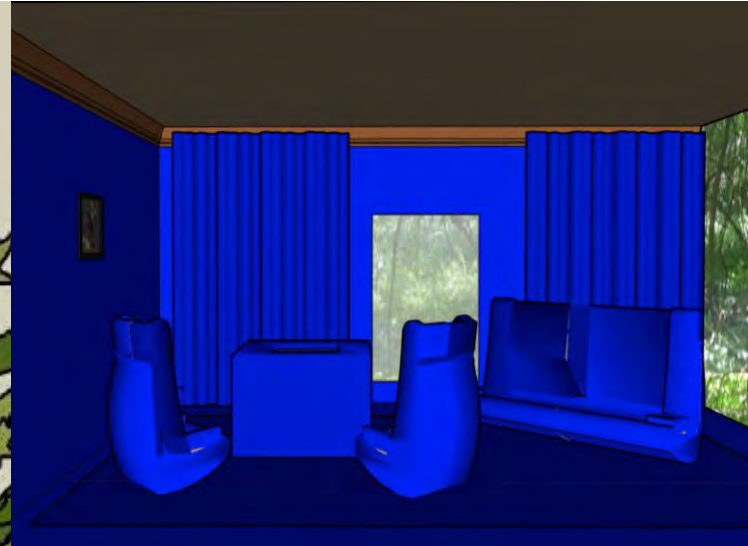












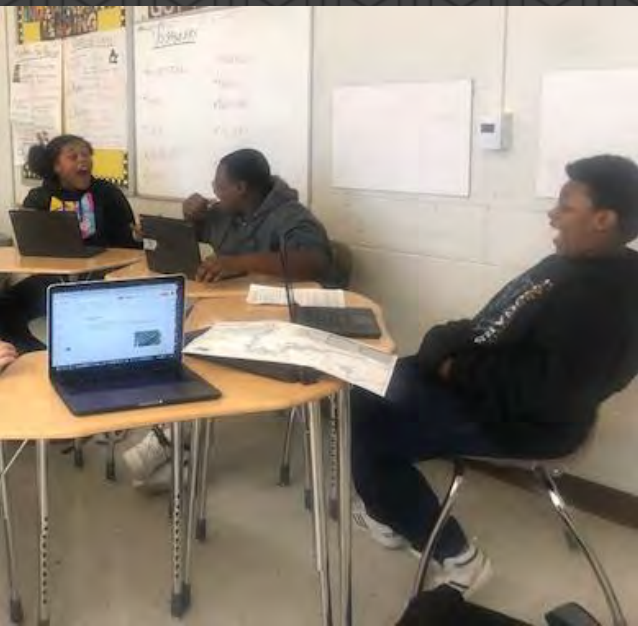
BLACK PANTHER + AFROFUTURISM



CULTURAL INSPIRATION

- Top View of school design
- Inspired by African Prints
- Geometric Shapes
- Concentric Circles & Curves











Engaging Black and Latinx students through communal learning opportunities: A relevance intervention for middle schoolers in STEM elective classrooms[☆]



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ARTICLE INFO

Keywords:

Research-practice partnerships
STEM urban education
Utility value
Student engagement
Relevance intervention
Communalism
Culturally relevant pedagogy

ABSTRACT

With the aim of bridging research in educational psychology and teacher education, we designed a research-practice partnership to unpack the concept of relevance from a race-reimagined perspective. Specifically, we employed a mixed-methods sequential explanatory research design to examine associations between the communal learning opportunities afforded to Black and Latinx students, and their engagement patterns during STEM activities. Within a nine-week instructional unit we provided students six opportunities to rate their scholastic activities. High levels of behavioral engagement were sustained over the course of the instructional unit. On weeks when students rated the activities as higher in communal affordances, they also reported more behavioral engagement. Classroom observations facilitated our efforts to create state space grids that show when and how teachers used emancipatory pedagogies to support students' learning. We used these state space grids, along with teacher interviews and student focus groups, to develop contextualized illustrations of two teachers of color as they successfully provided communal forms of motivational support over the span of six observations per teacher. These strategies differed based on three key factors: where the lesson was placed within the larger instructional unit, the way teachers interpreted and responded to their students' engagement patterns, and how the demands of the larger school environment impacted classroom dynamics.

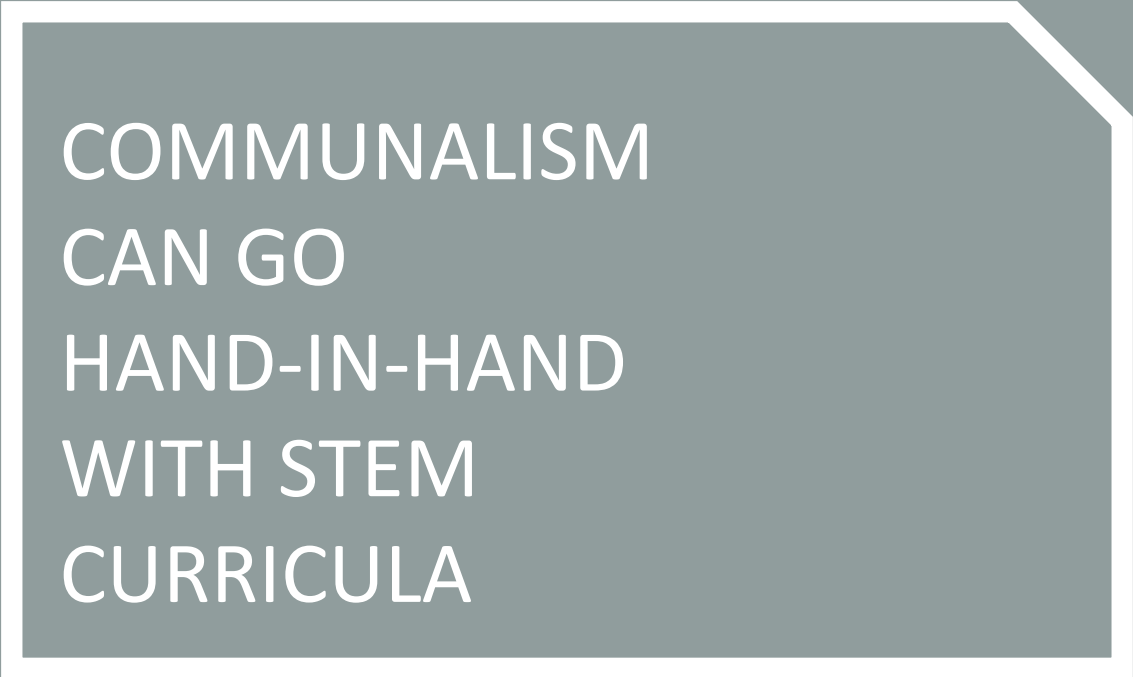
TAKE-AWAYS FROM OUR RESEARCH

DEVELOPING APPRECIATION FOR
ACADEMIC CONTENT INVOLVES BOTH
LESSON FRAMING AND STUDENT
DISCOVERY

THERE ARE GOOD REASONS WHY
INSTRUCTIONAL STRATEGY USE IS
NOT ALWAYS STABLE

STUDENT ENGAGEMENT ALSO SHAPES
INSTRUCTIONAL OPPORTUNITIES FOR
COMMUNAL UTILITY VALUE





COMMUNALISM
CAN GO
HAND-IN-HAND
WITH STEM
CURRICULA



COMMUNALISM
IS A CULTURAL
CONNECTOR



COMMUNALISM
IS A VEHICLE
FOR DEEP
ENGAGEMENT



THANK YOU

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Questions & Discussion



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