Creating equity in the digital classroom

Tyler Kinner

June 12th, 2020

WWTF Virtual Symposium

Agenda

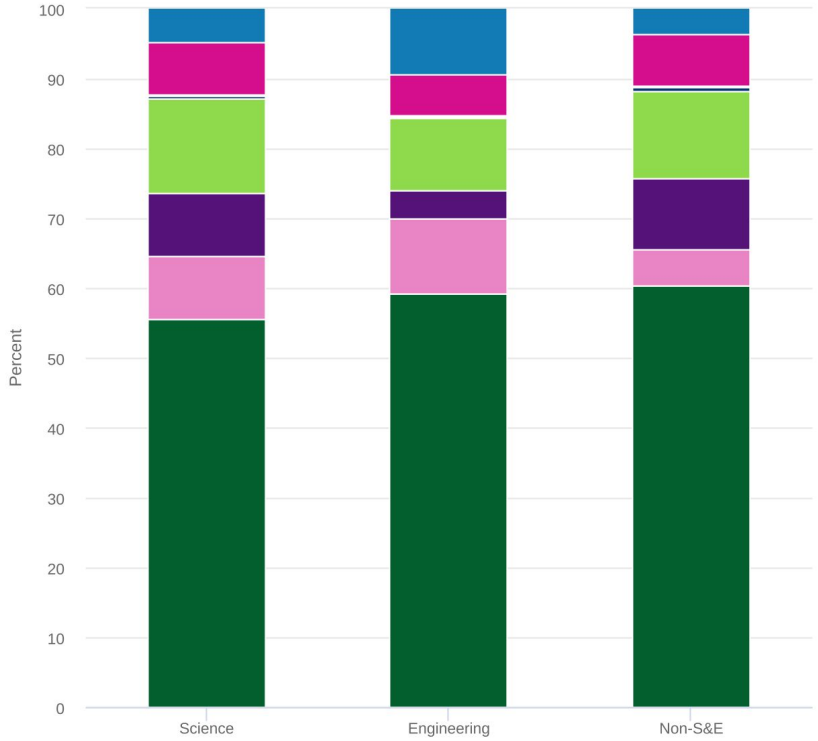
I. Why and what of equity in STEM
II. Culturally responsive pedagogy
III. Creating equitable and accessible digital spaces

Introduction

- WWTF - Piedmont College (Georgia)
- Chemistry, Science & Engineering Research Teacher at Meadowcreek HS
- Instructional coach for Gwinnett County Public Schools
- Now - Curriculum Development Lead at Georgia Tech Research Institute's STEM@GTRI program

National Center for Science and Engineering Statistics | NSF 19-304

FIGURE 3-B
Bachelor's degrees earned, by ethnicity, race, and citizenship: 2016



S&E = science and engineering.

Note(s)
Hispanic or Latino may be any race. Race and ethnicity breakouts are for U.S. citizens and permanent residents only.

Source(s)
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Why equity in STEM?

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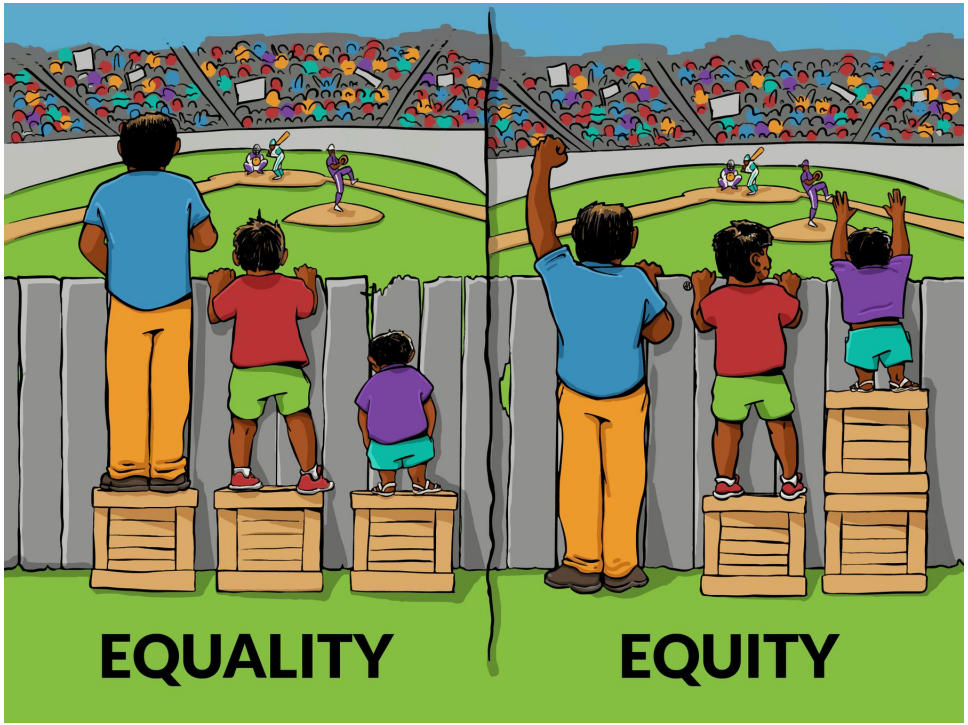

More than just “academic success”

- Equity for success on the test → differentiation
  - How many times have you differentiated, planned engaging activities and *still* were frustrated with the outcomes of your instruction?

More than just “academic success”

- How do you make the content valuable for students in how it relates to…?
  - To their lives
  - To their communities
  - To their history
  - To their future

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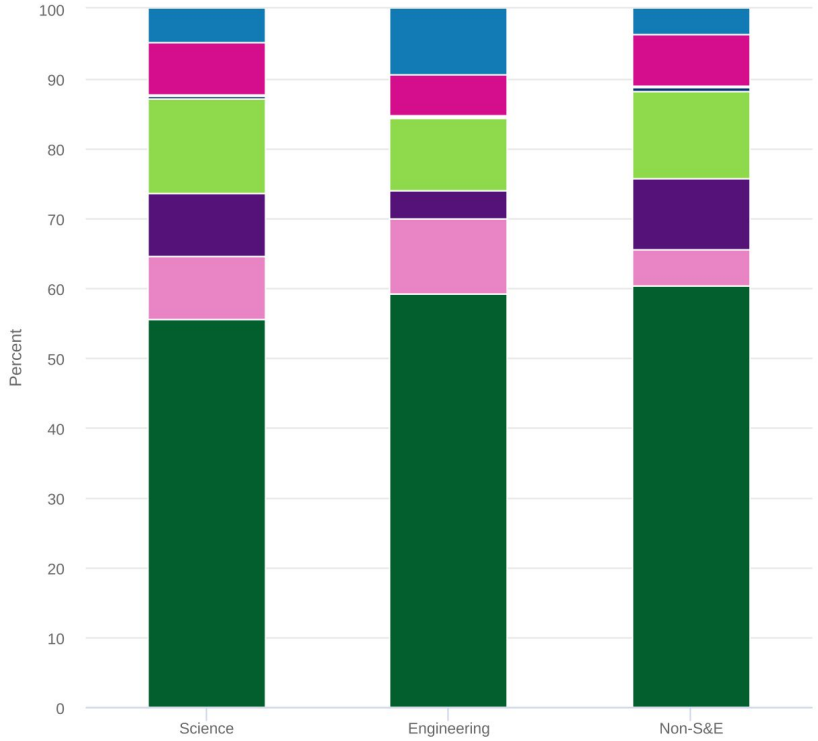

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Why equity in STEM?

Culturally responsive pedagogy

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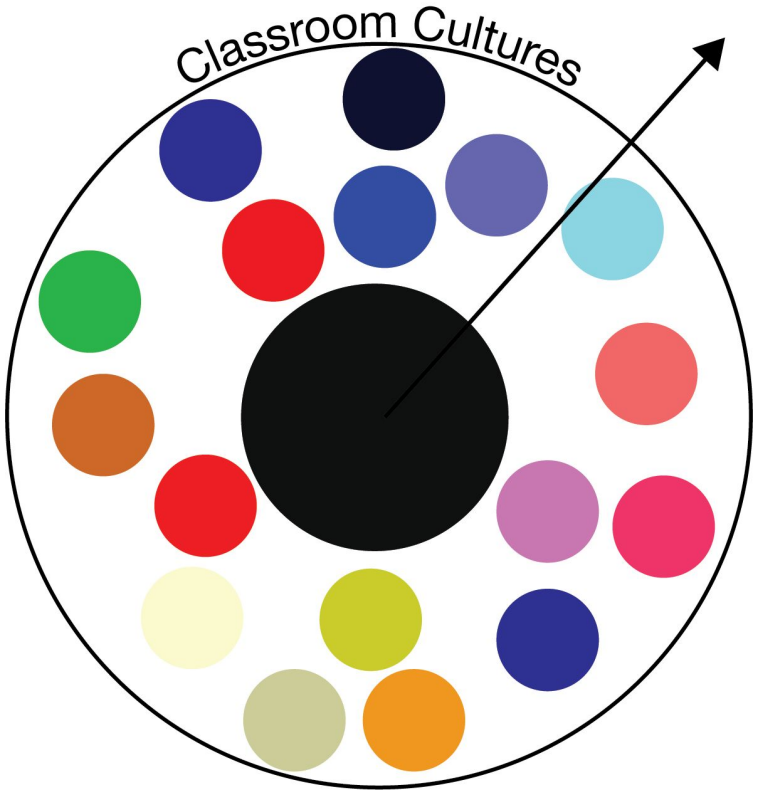
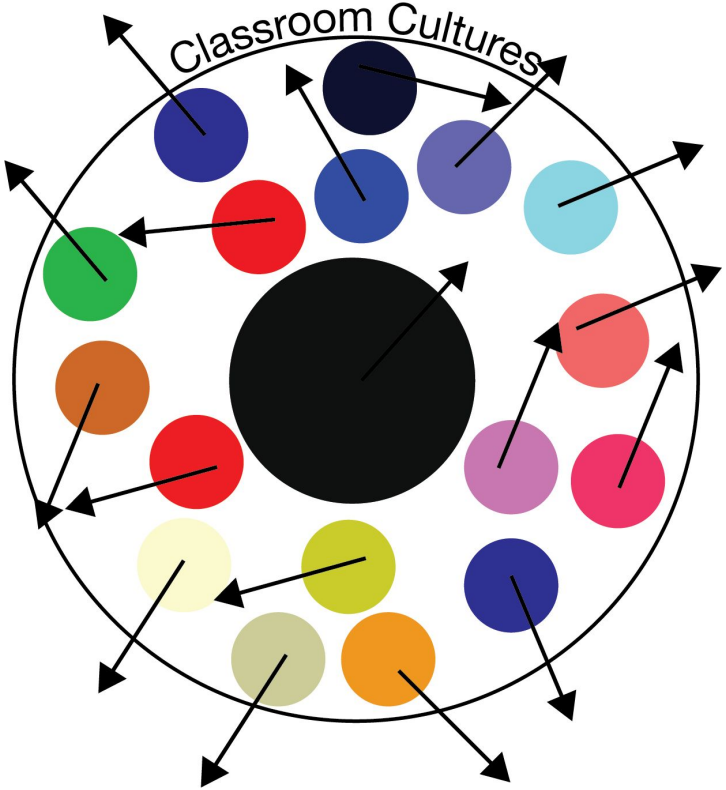


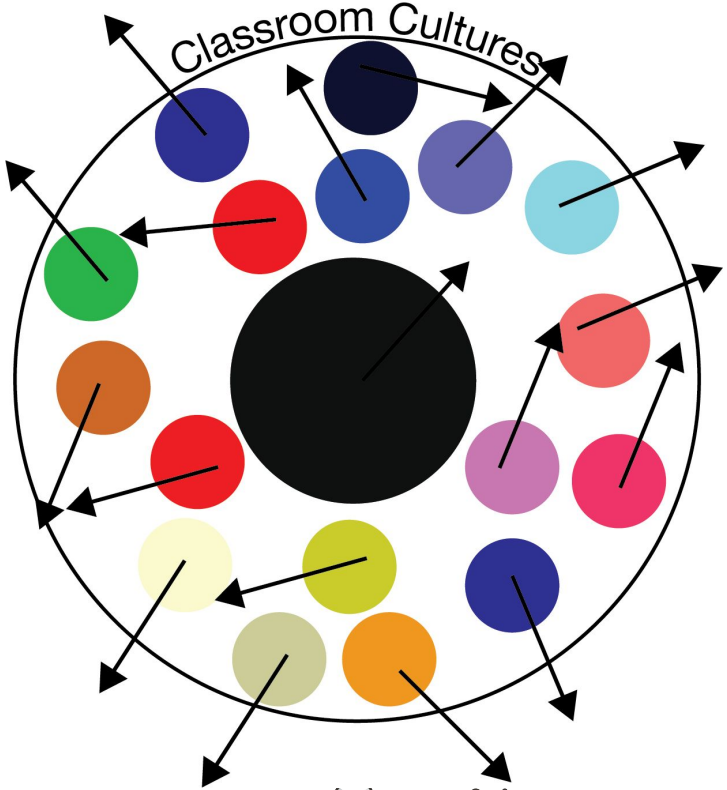
Culturally responsive pedagogy



Culturally responsive pedagogy

Work to identify and learn about the various cultures in your school

- you will not know or understand all of them



Culturally responsive pedagogy

Work to identify and learn about the various cultures in your school

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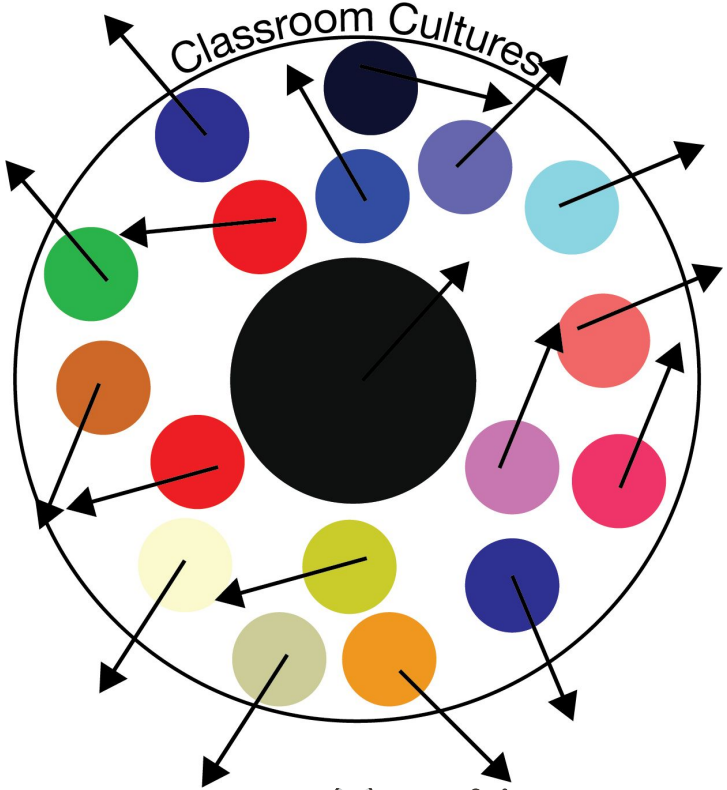
Intersectionality

- everyone exists at an intersection of various cultural identities
- just because you have studied XYZ culture, does not mean that you will understand your "XYZ students"



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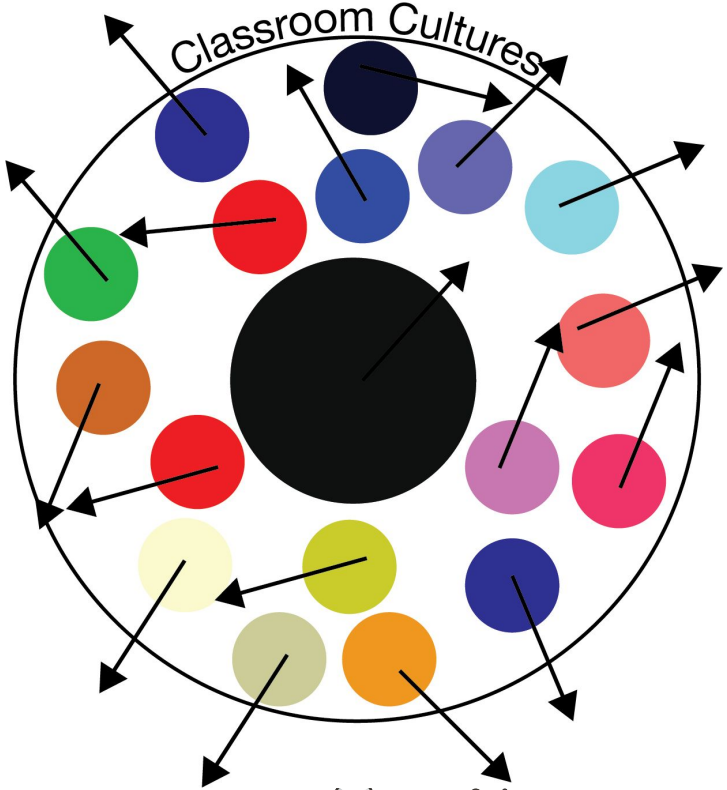
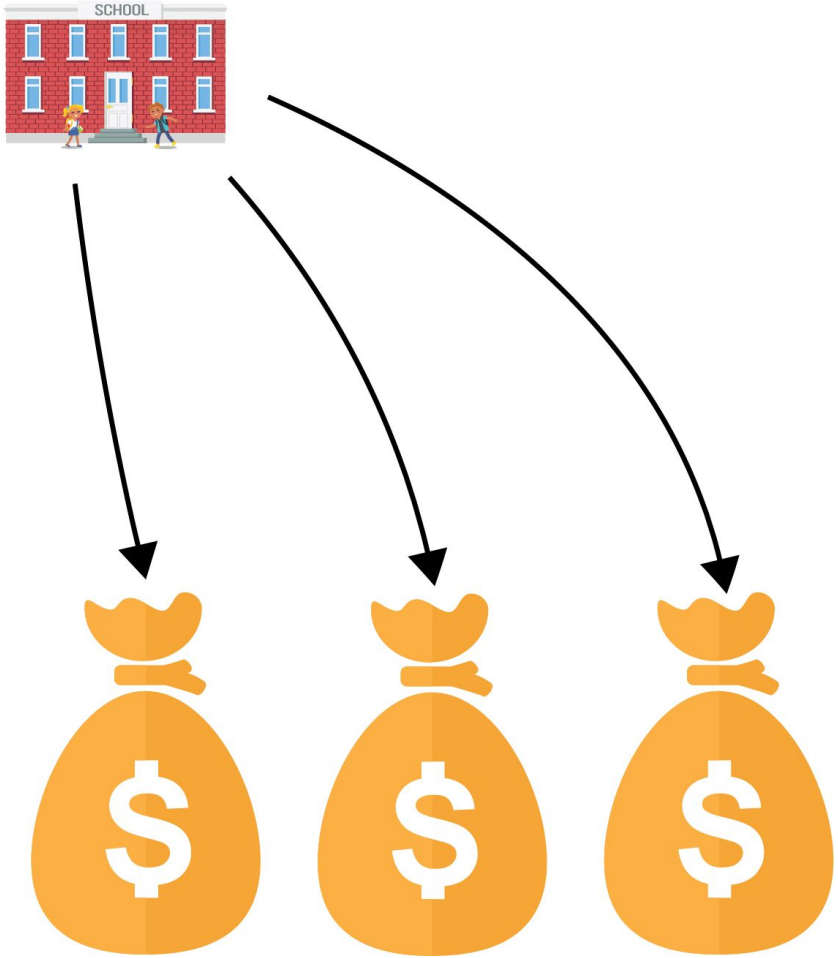
Provide space and resources for students to connect classroom content and skills to their cultural backgrounds, home lives and communities

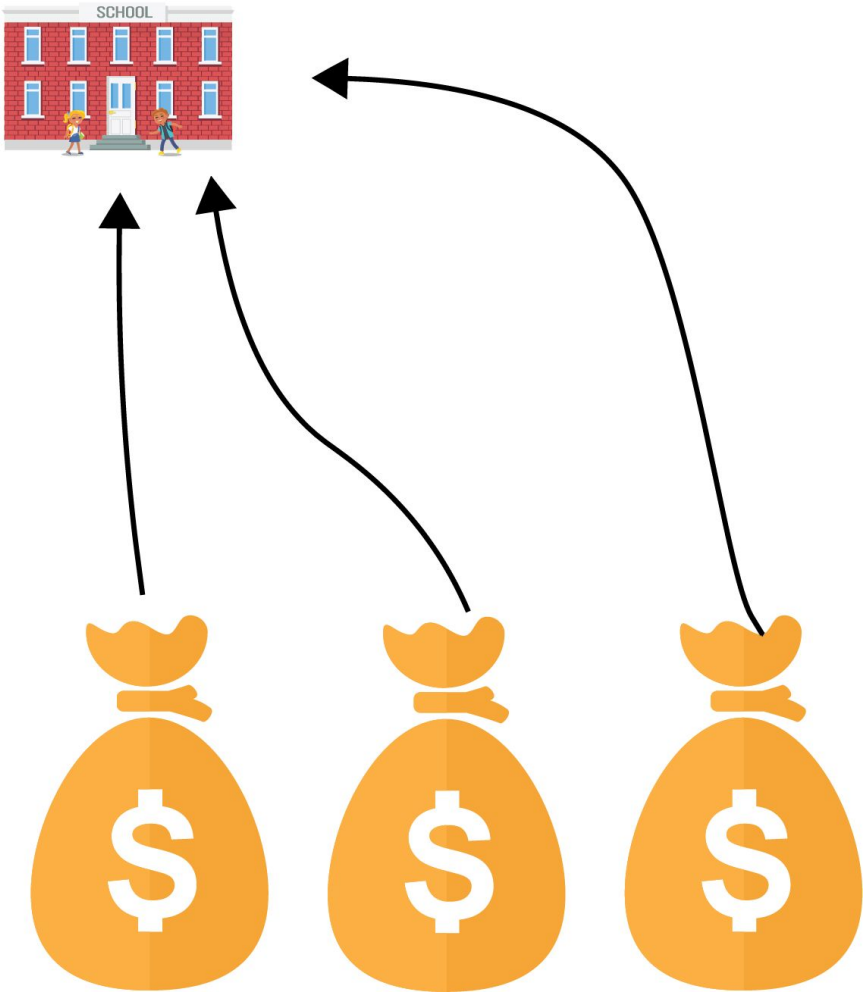
- students are a resource onto themselves!





Funds of Knowledge

- Paulo Freire - “banking model” of knowledge
- Teacher “deposits knowledge” via teaching to students
- How does this contribute to inequitable outcomes for students?



Funds of Knowledge

- Students *already know things*
- Culturally responsive pedagogy acknowledges and centers what students already know from:
  - Home
  - Community
  - Culture
  - Prior experiences
- Focus instruction → use existing funds of knowledge to obtain, evaluate and communicate new information

What does accessing funds of knowledge look like?

- Students are actively involved in the learning process
  - Beyond "active learning" activities
    - *how are students helping you teach in a way that leverages what they already know?*
  - How much work are we doing to identify students' funds of knowledge and leverage them?

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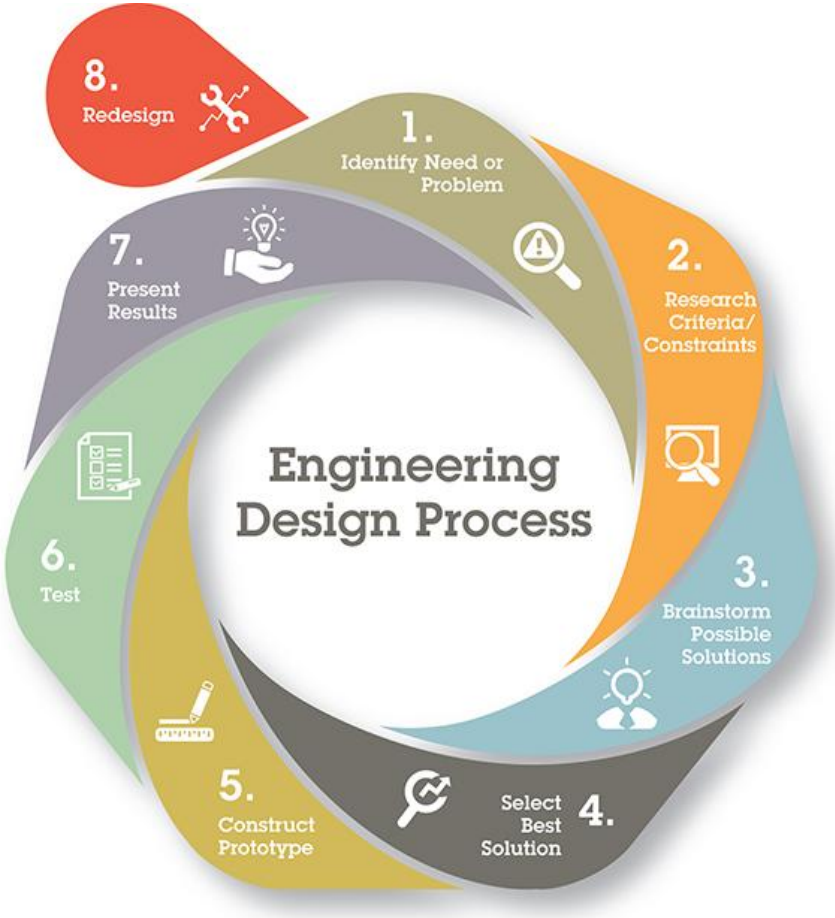
- Think of the engineering design process as a vehicle to leverage funds of knowledge

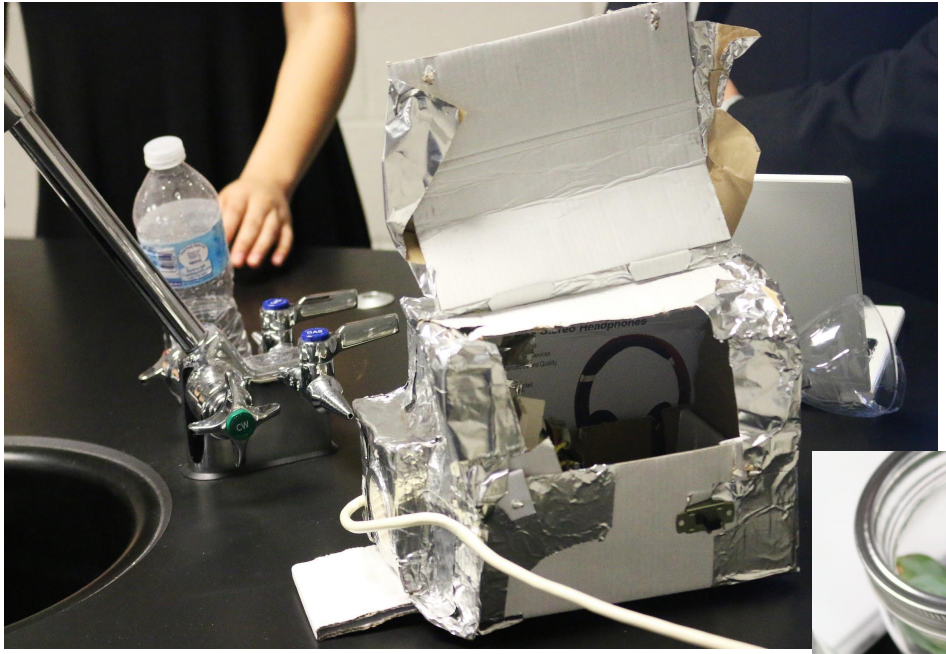
Bridges funds of knowledge with content area knowledge and skills

When given permission and space, students *will use* their funds of knowledge to identify needs or problems within their communities!

They will also access funds of knowledge throughout the engineering design process:

- Constraints
- Possible solutions
- Prototyping






ROSEMARY

Equity in the digital classroom

- Fundamental → technology and access
  - Digital or "bookwork"?
  - Degree of digital engagement, passive ← → active
    - Easier to watch a video than it is to engage in a virtual lab

- How do you engage in culturally equitable practices via a digital format?

Equity in the digital classroom

1. Working towards a working solution of the fundamental equity problem - technology access

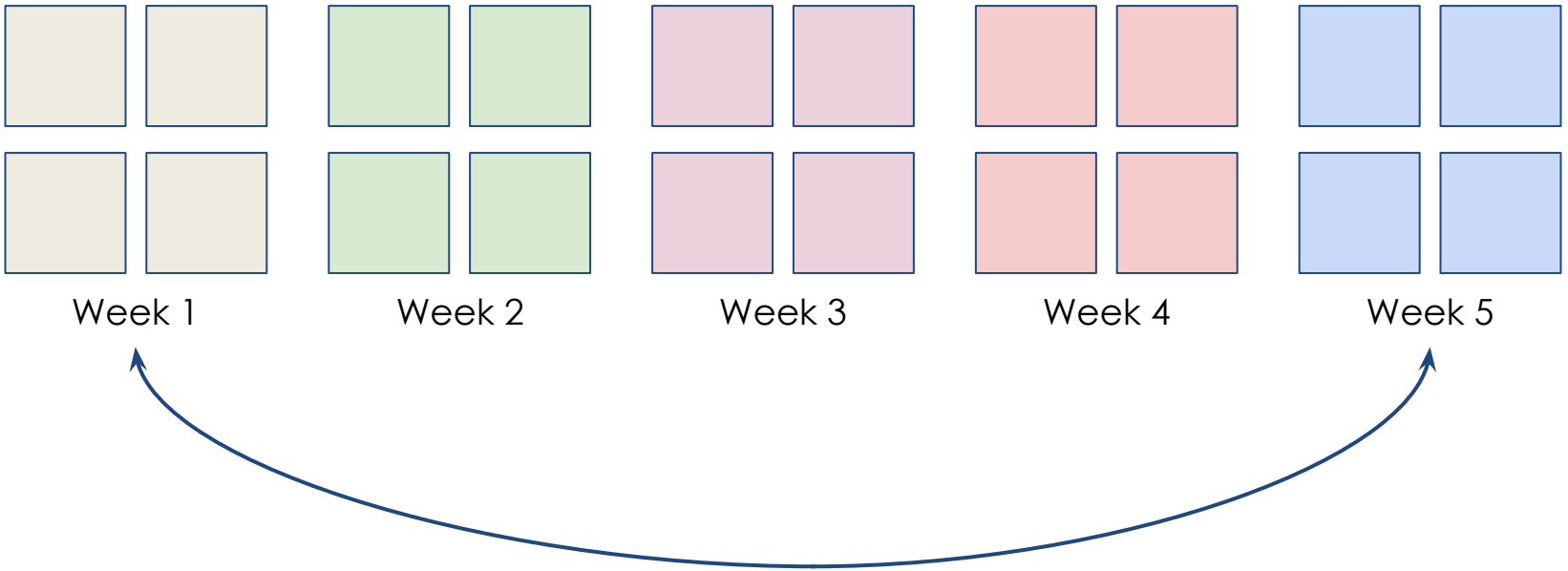
Who do you rely on for information about student engagement, accessibility, participation rates, etc.?

Equity in the digital classroom

Cogenerative dialogues (cogens)

- Developed by Christopher Emdin as part of his 7 C's
- Routine practice of involving students in planning instruction
- In the digital instruction moment → helps to understand the realities of student experiences

Cogenerative dialogues



Cogenerative Dialogues

We have to learn about the structure of the atom impacts how it interacts with other atoms

This is some examples of what this looks like and the types of problems you'll have to solve

What do you notice? What do you wonder?

Cogenerative Dialogues

We have to learn about the structure of the atom impacts how it interacts with other atoms

This is some examples of what this looks like and the types of problems you'll have to solve

What if I used a video to teach this? How do you think that may help you and your peers?

Cogenerative Dialogues

We have to learn about the structure of the atom impacts how it interacts with other atoms

This is some examples of what this looks like and the types of problems you'll have to solve

There's a cool virtual simulation that I want to use to teach this. Explore the simulation - what issues do you see?

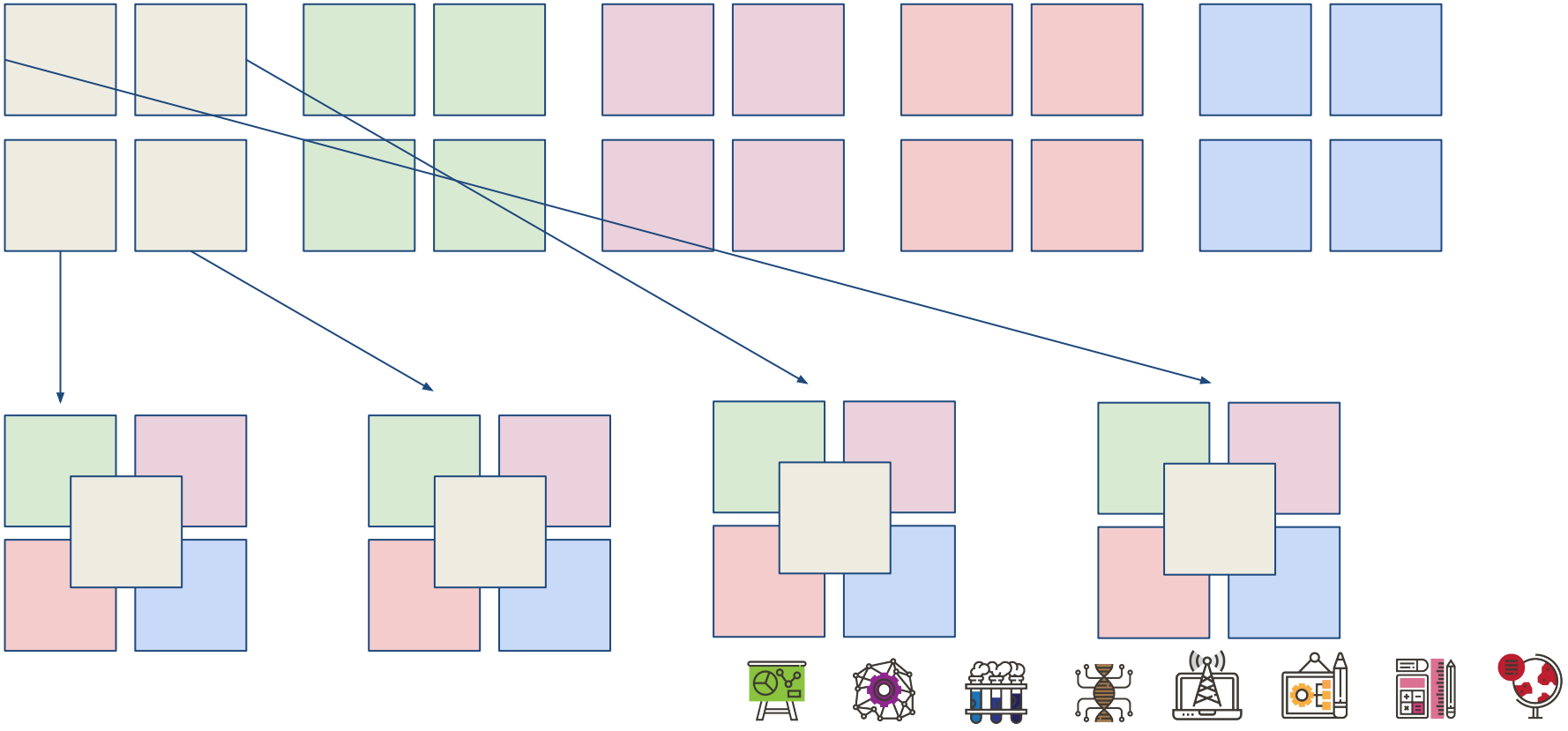
Cogenerative Dialogues

We have to learn about the structure of the atom impacts how it interacts with other atoms

This is some examples of what this looks like and the types of problems you'll have to solve

How else could we teach this so everyone can have an opportunity to learn the content and skills?

Co-teaching

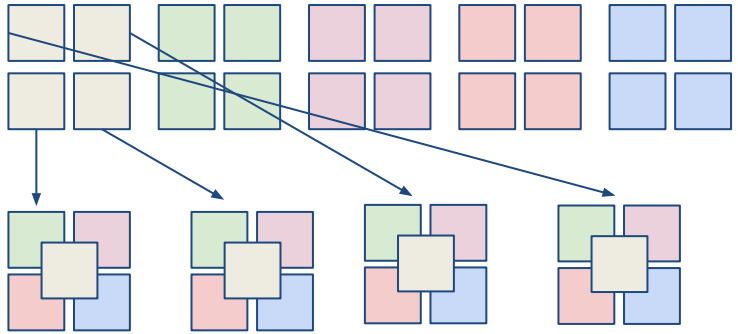


Co-teaching

- Use digital tools, like Zoom breakout rooms or create multiple Google Meet rooms

- Allow students to teach portions of a lesson

- Encourage students to develop their own teaching style (metaphors and analogies, examples, *how do they want to ask other students questions?)*



Context

- *“For example, a teacher might discover how important a local basketball tournament is by hearing about it from community members. The teacher doesn't explicitly tell students that their community and culture have value. Instead, the teacher conveys that message by attending the tournament and referencing it in class. This practice draws students to the content and builds strong teacher-student relationships.” - C. Emdin*

- *How can you connect and build relationships with students digitally?*

Context

- Create a Twitch or Youtube Live and stream more than just your lessons
  - Useful ways the content connects to real life
    - Kitchen chemistry
    - Home engineering
    - Physics of sports, dance, music, etc.

- Give students an opportunity to connect to you (appropriately!) as a person
  - Create a TikTok account and create TikTok challenges for students (bonus points for collaboration)
  - Set up a class Minecraft server

Context

- Use your current (and future) platform to elevate student voices

- Show respect towards students and their ideas, beliefs, culture, etc. by sharing space and putting them on equal footing with you

- Give power to students who are powerless in other settings
  - Show others in your field that students have intrinsic value and knowledge and “can do XYZ - in their own way”

Summary

- Equity is more than academic differentiation
  - impact how students value their own learning

- Actively seek out and utilize student funds of knowledge

- Use Christopher Emdin's 7 C's (cogens, co-teaching, and context and more!) to move towards culturally responsive pedagogy and creating equitable and accessible digital classrooms