

# P4E:STEM

## Developing DEI Curricular Interventions in Engineering and Computer Science

Rebecca Atadero • Jody Paul

IUSE PI Meeting  
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<https://partnership4equity.org>

# What were we trying to do with this project?

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Promote the formation of “**Inclusive Professional Identities**” for Engineering and Computer Science students.

- Necessary technical expertise
- Understand how diversity benefits professional practice
- Possess the skills to develop and work in inclusive team environments
- Recognize the impact of professional endeavors on society as a whole, and particularly on groups within society that have been historically excluded, marginalized or underserved.
- Value continued learning about Diversity, Equity, and Inclusion (DEI)

# Specific Project Activities at 4 Partner Campuses

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1. Develop curricula (class activities and assignments) containing DEI content for use in required courses within the majors.
2. Share activities between institutions, and expand pilot activities at CSU to other campuses.
3. Cultivate relationships with course instructors to develop, refine, and implement activities for their classes.
4. Collect qualitative and quantitative data to assess the impacts of the curricula on students and their learning.

# Today's Workshop

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1. Sample activity
2. Recommendations for activity design
3. Activity brainstorming in groups
4. Factors affecting implementation and longevity of activities
5. Wrap-up

Sample Activities are Shared on P4E Website

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<https://partnership4equity.org/resources.html>

# Domain: Computer Science

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What student characteristics suggest future success as a computer science major?

“What do you want to be when you grow up?”

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What student characteristics suggest future success as a computer science major?



A TEDx Stanford talk by Benjamin Williams

Benjamin Williams ([Links to an external site](#)) has a computer science degree from Stanford and is a software engineer, entrepreneur, and hip-hop dancer. In this video he is accompanied by dancers Monyett Crump Jr. and Jasmin Williams. Consider the questions from the previous page as you watch the video.



# Reflection

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How does the **environment** [outside of educational institutions] influence someone's choice in whether to pursue a career in computing?

# Reflection

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What attributes of the classroom environment *encourage* someone to pursue a career in computing?

What attributes *discourage* someone from such pursuits?

How does the environment [outside of educational institutions] influence someone's choice in whether to pursue a career in computing?

# Reflection

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What character would **you** like to be in the stories of other people?

What attributes of the classroom environment *encourage* someone to pursue a career in computing?

What attributes *discourage* someone from such pursuits?

How does the environment [outside of educational institutions] influence someone's choice in whether to pursue a career in computing?

# CS Activity Redesign

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- What should be kept in this activity?
- What changes would improve this activity?

[https://partnership4equity.org/resources/Lesson-Plan\\_Identities-in-Computing.pdf](https://partnership4equity.org/resources/Lesson-Plan_Identities-in-Computing.pdf)  
( all preparatory and reflection prompts)

# Curricular Activity Design Suggestions: Begin with realistic learning objective(s)

## Examples:

1. Students will be able to identify how different perspectives might contribute to a problem-solving situation and explain how these different perspectives might enhance proposed solutions.
2. Students will be able to compare and contrast the meanings of equality and equity in the context of \_\_\_\_.
3. Students will be able to critique the adequacy of design criteria for a scenario.
4. Students will be able enact inclusive strategies when working on teams.

# Curricular Activity Design Suggestions:

## Consider the implications of your content

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- Thinking about how this subject or type of work affects (or relates to) people is often a good place to start.
- Students are attracted to things that relate to their lives, giving significance to an abstract concept can help learning.
- We believe there is value to relating the topics directly to the practice of engineering or computing - but don't try to "hide" the DEI content
- May need to stretch your content or make explicit how your content relates

# Curricular Activity Design Suggestions: Start small

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- Don't try to do it all at once
- Expect to revise and refine your assignments over time and as you learn more
- A series of small changes that can be sustained can accumulate to a meaningful transformation

# Curricular Activity Design Suggestions: Don't do this alone

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- Share your work with colleagues to create new norms in the department
- Ask others, including students, for input and feedback
- Invite others to your class to help



# Curricular Activity Design Suggestions:

## If you think this content is important, act like it

- Give students enough time with the activities.
- Explain why you thought this activity or assignment was important to include in the class.
- Explicitly state relevant learning outcomes.
- Incorporate DEI in your pedagogy, not just your content
- Demonstrate that you are learning too and express a curiosity to know more about others

# Small group discussion

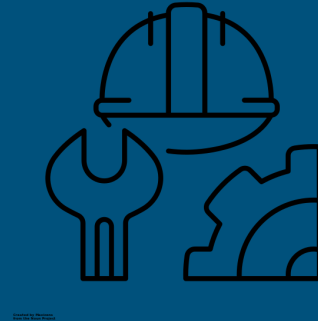
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1. Select a course or subject area
2. What DEI learning objective would be a good fit for this course?
3. How does the course content relate to people? (or DEI in other ways)
4. Where is a good place to **start** integrating DEI into the course?
5. Who do you know in your field or department or campus that could give you feedback?
6. How will you demonstrate the significance of this content to your class?

# Varied Implementation Environments Required Different Approaches and Activities

## Disciplines

- Engineering (+sub-disciplines)
- Computer Science
- **STEM+C**



**This applied to research instruments as well as curricular activities.**

# Varied Implementation Environments Required Different Approaches and Activities

## Institutions & Programs

Research-focused · Education-focused

Urban

Selective admission · Open enrollment

Land Grant

Predominantly White · Minority Serving

Decision-making Contexts

Public · Private · Non-Profit

**This applied to research instruments as well as curricular activities.**

# Varied Implementation Environments Required Different Approaches and Activities

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## Student & Faculty Demographics

- Traditional, Non-traditional
- Full-time, Part-time, Occasional
- Continuing, Transfer
- Homogenous, Diverse, Under-represented

**This applied to research instruments as well as curricular activities.**

# We Represent Just Two Implementation Environments

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# The Implementation REALLY Matters

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We *thought* the similarities across disciplines and institutions would be sufficient to facilitate transferability

We *found* that the differences across disciplines, institutions, **and individuals** were significant and severely limited what would transfer

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Upon reflection, there *may* be discernible **patterns of design** that would enable greater transferability and facilitate new activity development

# We Have Work to Do

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Practice what we preach

Model continued growth and change

This work is doable

Change happens (we are all agents of change)



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