Engaging Underrepresented Students in CS
Welcome and Introductions

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Why do we need this panel?
The Leaky Technology Pipeline: A Framework for Understanding Disparities in Tech
(1) There are multiple leaks across the pipeline where we are losing talent.

**BARRIERS TO ACCESS**
- high-quality education and courses
- peer, family, college networks
- cultural capital
- internship/mentorship/training

**PSYCHOLOGICAL BARRIERS**
- stereotype threat
- imposter syndrome
- perceptions of the field and environmental cues
- lack of same-race/gender role models
- belonging and isolation

**BIASES (CONSCIOUS & UNCONSCIOUS)**
- expectations and beliefs about ability
- stereotyping and decision-making patterns
- overt mistreatment and microaggressions

(2) There is BOTH a pipeline problem AND a bias problem.

(3) Stakeholders must implement comprehensive solutions to increase diversity in tech.
“Culturally relevant teaching is a pedagogy of opposition that recognizes and celebrates Africans and African-Americans”
- Gloria Ladson-Billings
Culturally Responsive Computing:

- Asset building
- Reflection
- Connectedness

Dr. Kim Scott, Compugirls
Session Flow

1. Panel presentations: Early exposure to career pathways
2. Peer learning and sharing out
Who’s in the room?
Early Exposure: Hackathons
Solomon Russell
Computer Science PD is different
➢ Inquiry
➢ Equity
➢ CS Concepts
➢ Culturally Relevant
Creating a Culture
SMASH Core Values

1. Excellence in STEM Education
2. Community / Teamwork
3. Leadership
4. Social Justice
5. Sustainability
Culturally Relevant Pedagogy
Dan Garcia
CSTA Golden Gate chapter @ UC Berkeley
(we gather Bay Area HS Computing teachers monthly)
We hold regular workshops and share best practices to engage diverse students!
CS Education Day @ UC Berkeley

(500 Jrs and Srs visit campus during CS Education Week for talks and hands-on CS!)

We choose the schools to invite based on their % of diverse students!
BJC Award-winning Projects being demonstrated at **CS Ed Day**

Let older students show younger students great examples of what can be done!
BFOIT Middle-School (SCI-FY) and High-School (ITLP) Summer Graduations
2-week Summer Institute in August, Monthly meetings (program now closed)
Let them demo their (choose-your-own) final projects to friends and family!
CS Scholars Program follows a cohort model; these students take the same courses and are placed in the same discussion sections in our CS program. Keep a cohort together so folks never feel isolated; selected according to need…
One way to get computing into K-12…

- New Course: “Computer Science : Principles”
  - Engaging, accessible, inspiring, rigorous
  - Focused on the fundamental concepts of computing (Computational Thinking)
  - An impetus for college curriculum reform

- SINGLE SOURCE OF NATIONAL LEVERAGE!

[Website link: csprinciples.org]
what is CS Principles?

- computing is a **Creative** activity.
- **Abstraction** reduces information and detail to facilitate focus on relevant concepts.
- **Data** and information facilitate the creation of knowledge.
- **Algorithms** are used to develop and express solutions to computational problems.

7 big ideas

- **Programming** enables problem solving, human expression, and creation of knowledge.
- the **Internet** pervades modern computing.
- computing has global **Impacts**.
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6 computational thinking practices

- connecting computing
- developing computational artifacts
- abstracting
- analyzing problems and artifacts
- communicating
- collaborating
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Two Performance Task Assessments

- **Explore PT**
  - “…you will explore a computing innovation of your choice”

- **Create PT**
  - “This performance task requires you to develop a program on a topic that interests you.”
The innovation and impact of social media and online access varies in different countries and in different socioeconomic groups.

Groups and individuals are affected by the “digital divide” — differing access to computing and the Internet based on socioeconomic or geographic characteristics.

The global distribution of computing resources raises issues of equity, access, and power.
What we’ve found works

- Make “Fun” a learning objective!
- Name your course accurately
- Pair Programming throughout
- Read & comment about each others work
- Make the class free (no barriers to entry)
- Awesome TAs as role models (50-50)
- Lab-centric instruction, enthusiasm!
- Program powerful ideas with blocks
- Have open-ended projects

bjc.berkeley.edu
SMASH + BJC Academic Year Program @ UC Berkeley, near Stanford, UCLA

Every Saturday from 2015-2016 they gathered, a local teacher taught them BJC…

We reached diverse students who had no access to a high school CS course!
UC Berkeley Professor Drops Pre-Final Computer Science Rap (VIDEO)

UC Berkeley professor Dan Garcia recently laid down a full-blown “Gin & Juice” remix to help get his students ready for a final.

Don’t hesitate to show your flavor, and share your interests with your students!
Tiffany Price
Kapor Center for Social Impact
Tech Diversity & Inclusion
~ Caveats ~
Environment Matters
Aesthetics & Themes

WE ARE ALL WONDER WOMEN!
Power of the Cohort Model
Gender-Specific Models
Pedagogy Matters
Culturally Relevant?
Problems that Matter

To whom?
Support That Matters
The Extras Matter: Know the Landscape
Hackathons & Competitions

STARTUP WEEKEND
OAKLAND

Latinx Tech Edition | Oct. 21-23 | Kapor Center

powered by techstars, Kapor Center for Social Impact, and Kapor Capital
Networks
Slides & Resources

Questions

Is there a time in CS where you felt disengaged or ‘shut down’?
Questions

What are the most engaging pedagogies and curricula that you’ve experienced or designed?
What are the barriers to engagement? How do you overcome those?