STEM Programs Unwrapped

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SPACE GRANT FALL MEETING – TUSCON
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Representation Gap

STEM Degrees

- All STEM Degrees: 39%
- Women in STEM Workforce: 24%

Engineering Degrees

- All Engineering Degrees: 20%
- Women in Engineering Workforce: 11%

(Fouad et al., 2012)
STEM Education

**Problem:** Girls avoid science

**Cause:**
- The parents just don't care
- Girls don't have enough exposure/experience
- Girls aren't ready for science
- Their families don't value STEM education
- Girls lack confidence in math & science
- They are coming from a "culture of poverty"

**Solution:** Fix student interest
Human Spaceflight

**Problem:** Crew member avoids spacewalks

**Cause:**
- Suit problem?
- Airlock malfunction?
- Poor procedure?
- Workload?
- Mission unclear?

**Solution:** Fix suit, procedure, train and support
STORY OF THE STEM PIPELINE

The STEM Education Narrative

Aspiration Interest → Academics Graduate → STEM job Income

Elementary → Middle School → High School → College → Workforce

Academics Interest → STEM major Internship
Science culture

- Science is a very cultured experience.
- Assimilation - “cultural crossing” (Aikenhead & Huntley, 2009)
- We need scientific “bilingualism” (Lee, 1995)
- Chilly environment (Fouad et al., 2012)
Instrument

- 27 question online quantitative questionnaire
- 10-15 minute
- STEM educators
  - Out-of-School-Time
  - Camp
  - Museums
  - Science Centers
Respondent Profile

13.6 years Average STEM education experience (n=75)

Gender 68% female 32% male (n=73)

Race (n=72)
75% white
11% black or African American
7% Latino American
7% Asian American
4% Multiracial American
3% Native American or Alaskan American
1% Native Hawaiian or Other Pacific Islanders American
Question 8: Select which of the following elements are present in the program (check all that apply)

- Visual Tactile Small Group: >80%
- Movement Peer Feedback Student-driven: 57%
- Auditory Pop Culture: >35%
- Cultural Heritage Racial and Ethnic Identities: 19%

N=94
Question 10 & 11

Is the program exclusively for...

- Girls only? 13% (n=94)
- Girls of color only? 1% (n=90)

By practice:

10% of programs have over 50% girls of color participation.
Thank you!

QUESTIONS?
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