California Girls in STEM Collaborative presents

Growing Together:
The Future of Programs for Girls

Friday, October 15, 2021
12:00pm - 1:30pm PST
Online via Zoom

Featured Speakers

The Research Group at Lawrence Hall of Science, Corey Newhouse, Scott Burg

National Girls Collaborative Project

Goal of Webinar

- Help girl-serving organizations improve and sustain their programming
  - Continuous Program Improvement
  - Make Research-Based Decisions about New Strategies
  - Make the Case for Our Work
  - Increase Funding and Profile for Sector

Speakers

- Moderator: Carol Tang, Children’s Creativity Museum
- Panelists:
  - Kelly Grindstaff, Research Group, Lawrence Hall of Science, UC Berkeley
  - Scott Burg, Senior Researcher, Rockman et al.
  - Corey Newhouse, Founder and CEO, Public Profit

The Lawrence Hall of Science
UNIVERSITY OF CALIFORNIA, BERKELEY

Research and Evaluation
For California Girls in STEM

Kelly Grindstaff, PhD
The Research Group
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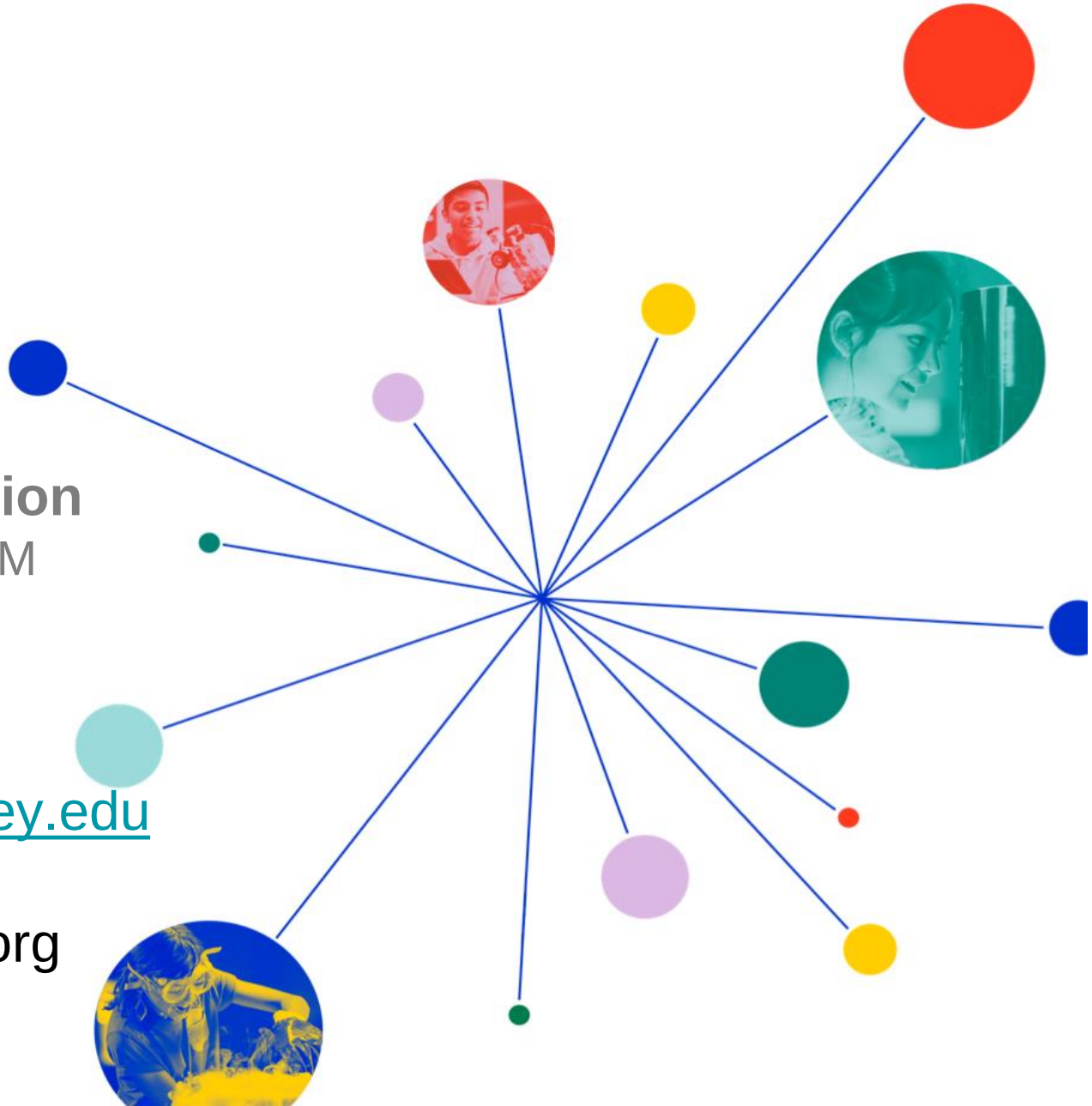
lawrencehallofscience.org



Thank you!

Research and Evaluation

	Research…	Evaluation…
Purpose…	test and produce generalizable findings	determine the effectiveness of a specific program or model
Questions originate from…	scholars in a discipline	key stakeholders and primary intended users of evaluation findings
Quality and Importance determined by…	peer review in a discipline	those who will use the findings to take actions and make decisions
Ultimate test of Value..	contribution to knowledge	usefulness to improve effectiveness

-Michael Quinn Patton

Research Example:

Educational Pathways Into College and Career (EPICC)

Research explored whether the EPICC program could support positive changes in underrepresented youth's (including girls') STEM attitudes and beliefs.

- RQ1: To what extent did EPICC provide a meaningful and engaging STEM-based service-learning experience for students?
- RQ 2: How did participation in EPICC influence students' interest, knowledge, and skills related to STEM and STEM careers?

Data Collection

- Surveys from Science Learning Activation Lab + Career Interest

– Fascination, Values Science, Career Interest, Background, Engagement

- Observations

– Science and Engineering Practices; 21st Century Skills

- Knowledge and Skills

– Solar Energy, Mathematics related to Solar Energy, College and Career, Life Skills

- Interviews

– Students group interviews, Parent group interview, Individual interview with staff

Increased Science Learning Activation

	Fascination			Values Science		
	Pre or Retro-Pre*	Post	Effect Size	Pre or Retro-Pre*	Post	Effect Size
2015 EPICC	2.81	2.93	0.512	2.96	3.04	0.225
2016 EPICC*	2.27	2.99	1.291	2.53	3.26	1.444
Comparison*	2.34	2.50	0.351	2.38	2.59	0.614

Some New Career Interests

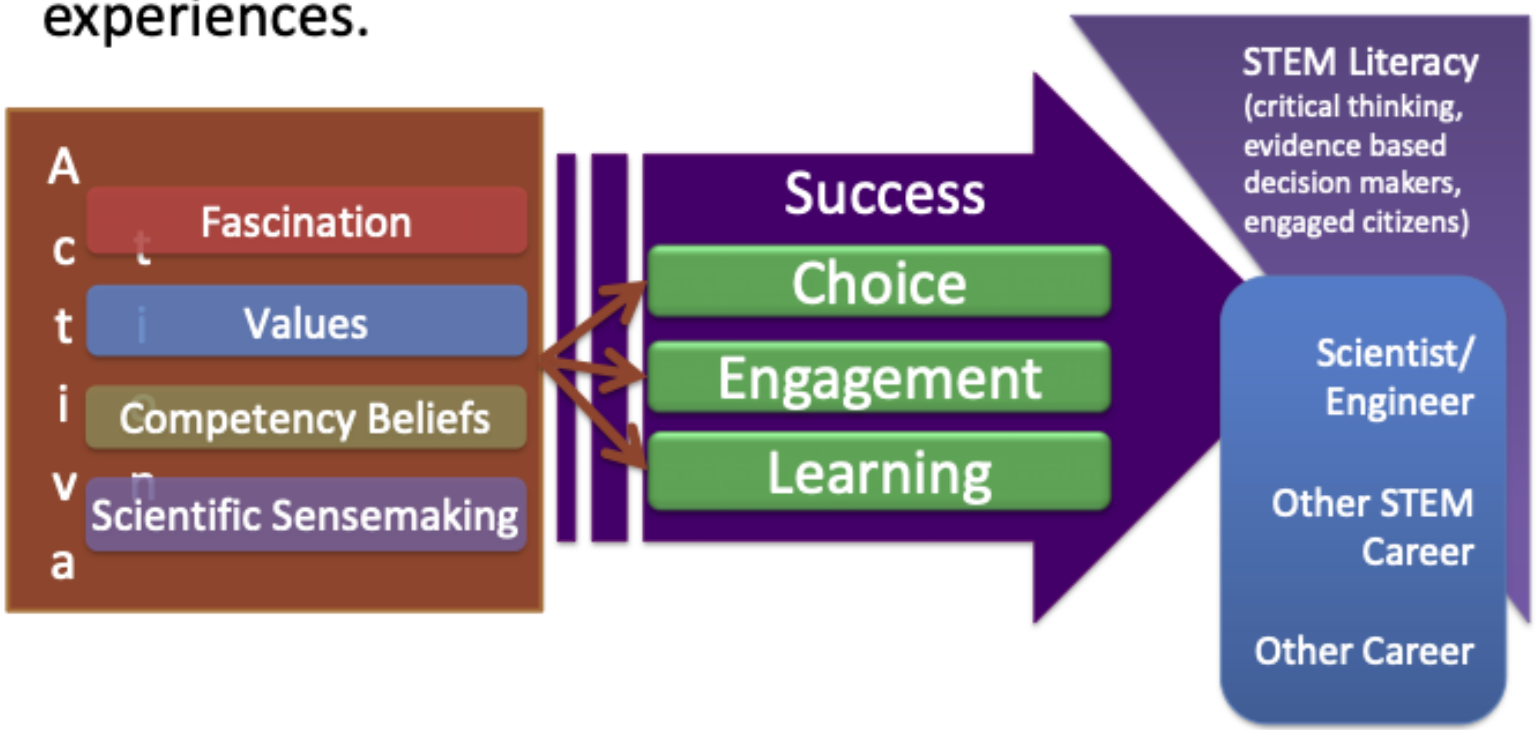
		Pre	Retro-pre	Post
Science	2015 EPICC	3.05 (.72)		3.27 (.70)
	2016 EPICC		2.68 (.89)	3.32(.72)
Math	2015 EPICC	2.64 (.90)		2.77 (.69)
	2016 EPICC		2.18 (.85)	2.59 (.91)
Engineering	2015 EPICC	3.00 (.80)		3.09 (.79)
	2016 EPICC		2.14 (.83)	2.77 (.81)
Design Technology	2015 EPICC	2.83 (.89)		2.91 (.90)
	2016 EPICC		2.36 (1.00)	3.09 (.75)
Program Computers	2015 EPICC	2.64 (.79)		2.55 (.86)
	2016 EPICC		2.41 (.91)	2.86 (.99)

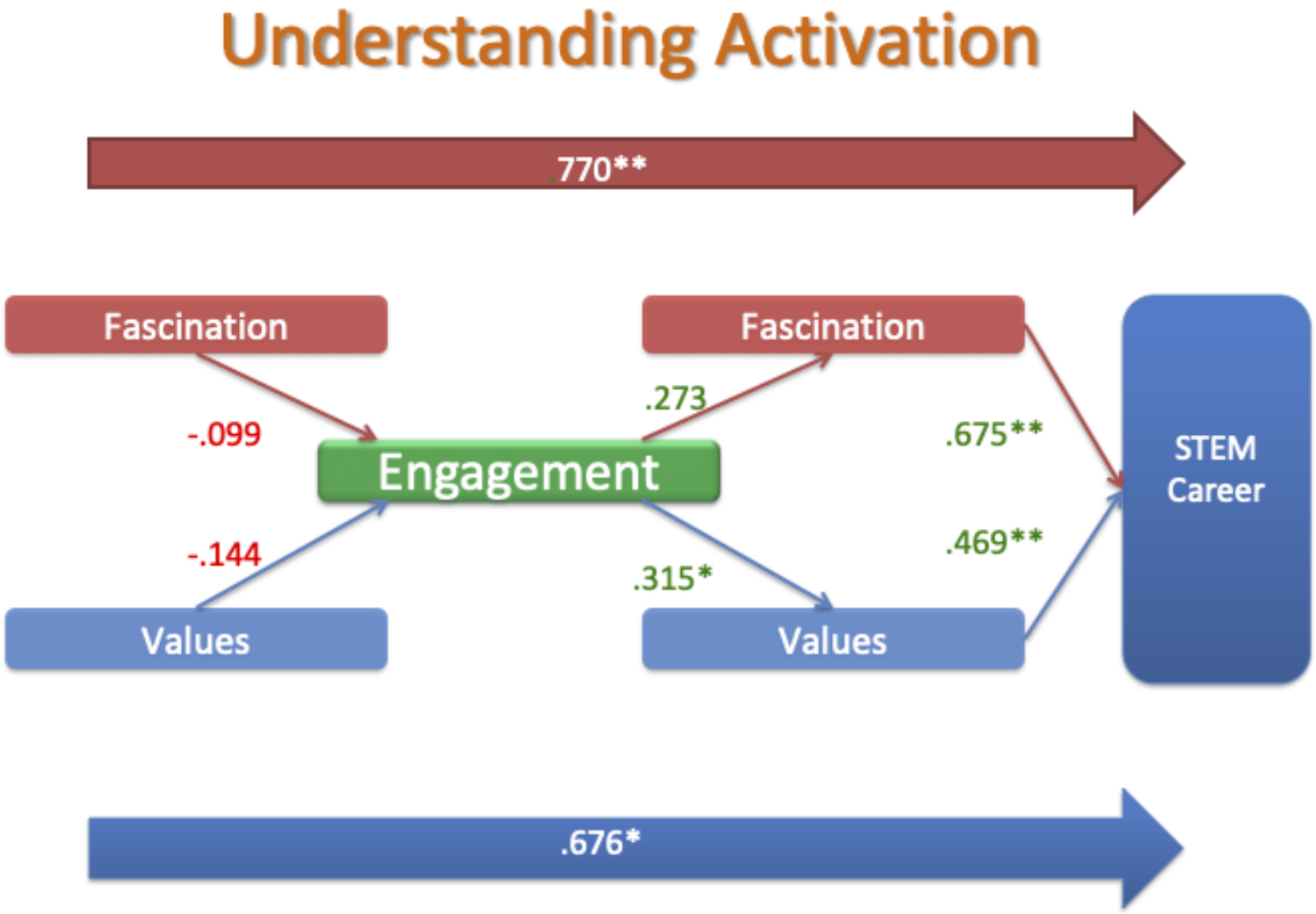
2015 EPICC participants showed increased interest in pursuing science jobs
2016 EPICC participants showed greater interest in all job types

Theory of Activation

Science learning activation =

A composition of *dispositions, skills, and knowledge* that enables success in proximal science learning experiences.





Service-Learning as a Lever to Support STEM Engagement for Underrepresented Youth

Melissa A. Collins, Joanna Totino, Ardice Hartry, Valeria F. Romero, Rosio Pedroso, and Rosalinda Nava

Journal of Experiential Education, pp 1 –16 © 2019
DOI: 10.1177/1053825919887407
journals.sagepub.com/home/jee

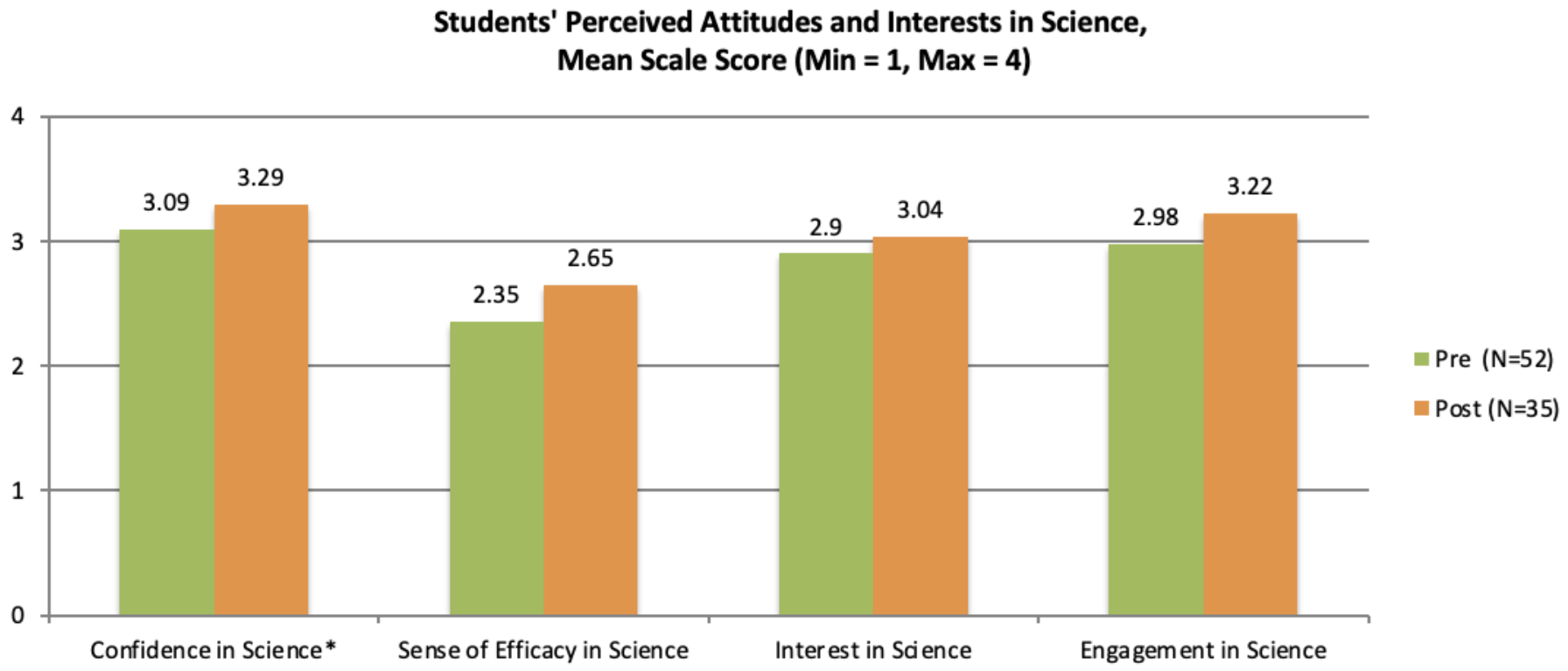
Evaluation Example: Five Stars Pathway

Evaluation of the **Five Stars Pathway Project** was to learn:

- How does the program influence girls' attitudes and interests in science?
- How does the program influence girls' perceptions about women in science?
- In what ways does interacting with multiple-generations of females (scientists, undergraduates, graduates, and elementary girls) influence middle / high-school girls in Five Stars Pathway?

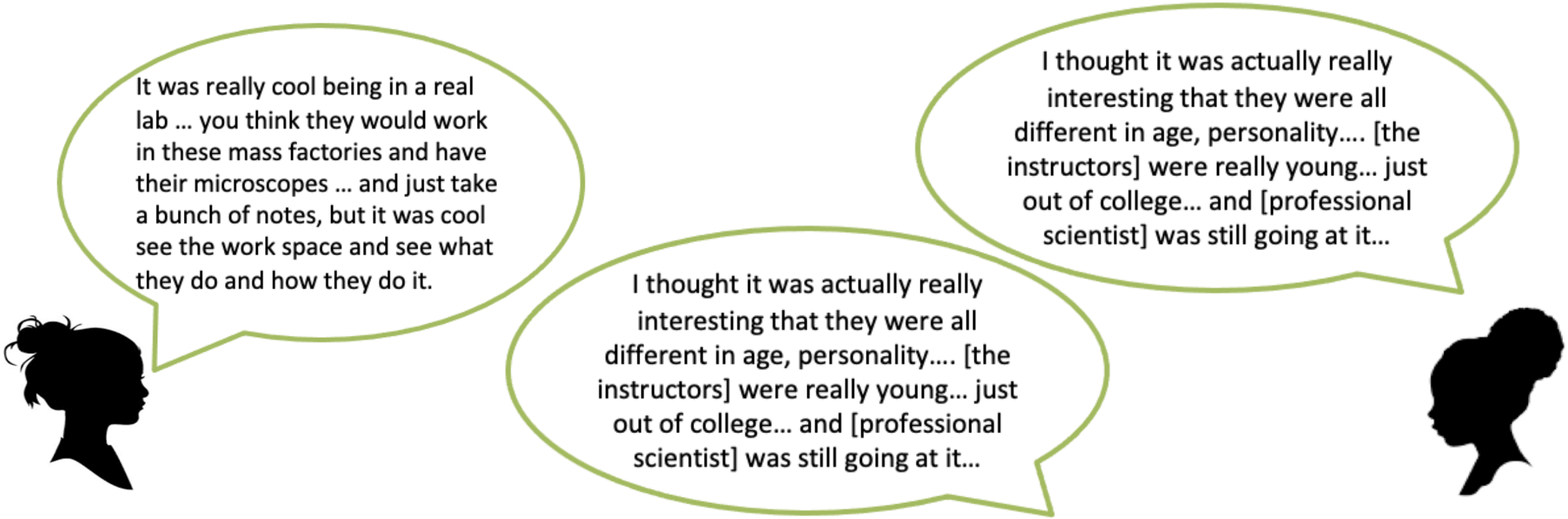
Influence on Girls' Attitudes and Interests in Science

By the end of participating in "Five Stars," students reported **a statistically significant increase** in ***Confidence in Science*****,** and appeared to have slight gains in *Sense of Efficacy, Interest and Engagement in Science.*



Influence of Interacting with Girls & Women in Science

- **exposure to a variety of women** and thus a **range of narratives and pathways**
- gained a **deeper understanding of who scientists are and what they do**
- **valued** that **Five Stars** made **science more accessible** *(through hands-on and real-world experiences, and female role models)*



How will you measure the construct of interest?
(whether to add to knowledge or evaluate how well a program met its goals)

Methods have to match what you are trying to find out.

Most important is **construct validity** - is your measure a good proxy for the construct? (e.g. does the survey question really get at the attitude? Does the task or question really evaluate the knowledge or skill?)

Internal validity and **external validity** don’t mean much if you don’t have **construct validity**.

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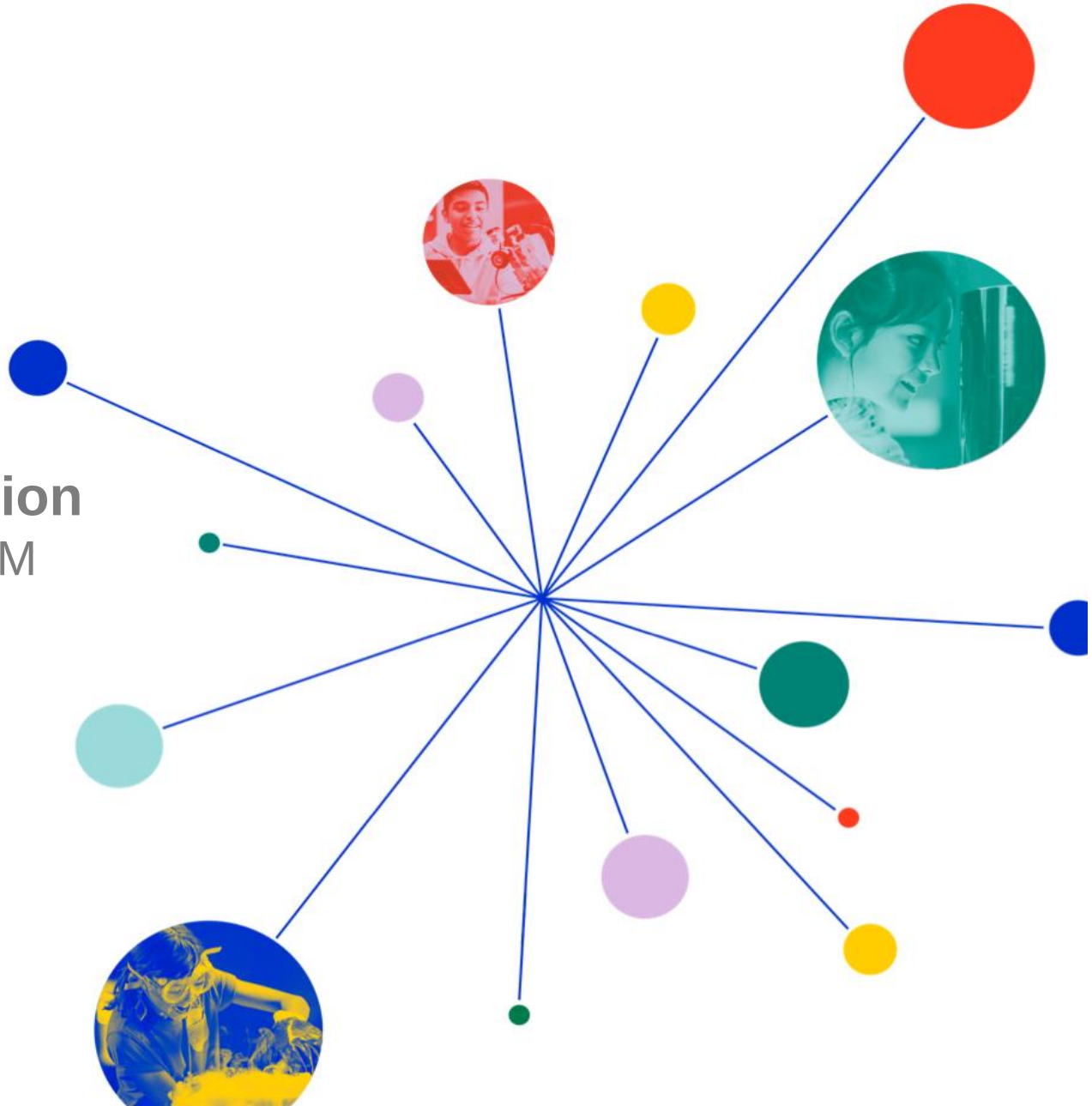


Girls in Making

Program Evaluation

Scott Burg
Girls in STEM
October 15, 2021
scott@rockman.com www.rockman.com

About the project

Program

Two-week summer program held at Children's Creativity Museum (July 2019)

Opportunity to support girls' conceptualization and design of makerspaces.

Participants

10 girls ages 10-12

Faclitated by Dr. Shalini Agrawal, PhD (Critical Ethnic Studies, CCA)

CCM Education staff

Context

Lack of supportive STEM learning environments for women

Gender bias in maker activities and leadership

Can informal ed help to address gender bias in STEAM and maker ed?

About the evaluation

Methods

Qualitative focus

Observed onsite camp activities over two weeks

Conducted interviews facilitators and participants, CCM staff

Design

Consulted with CCM staff/Dr. Agrawal on methods, question, focus areas.

Introduced myself to participants.

Approach

Inclusive/participatory focus

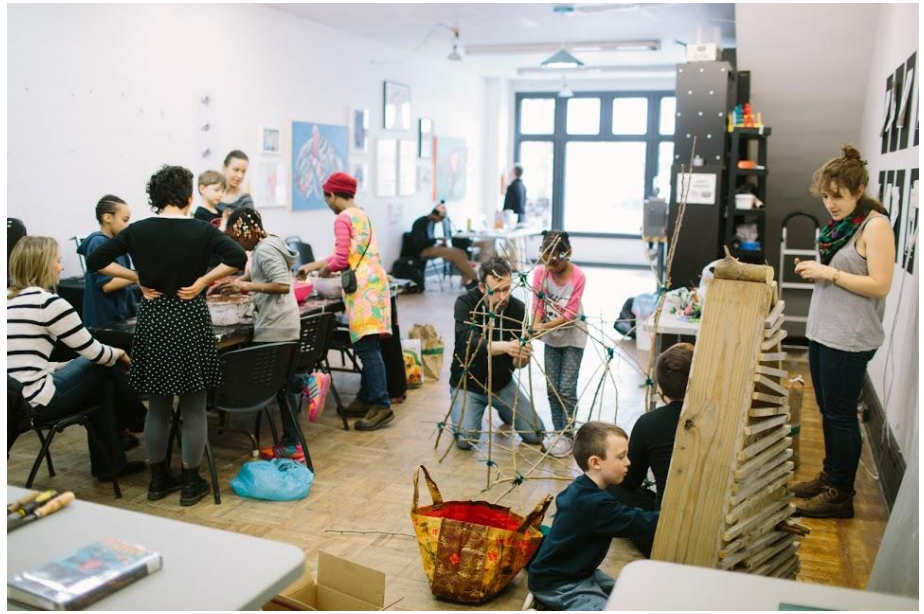
Ensure that participants felt safe, heard and respected

Flexibility - align with activities and facilitation approach

Setting the stage

- Camp guidelines - behavioral/attitudinal
- Importance of being respectful and supportive
- Being open to new experiences. Agency.
- Building relationships
- Strengthening identity

Site visits



- Critical look at makerspaces
- Applying a personal lens
- Inclusion, equity, comfort
- Emotional response and connectedness to space

Design thinking

- Design process linked to personal identity
- Less about maker activity/more about ‘space’
- Facilitator as guide - less prescriptive
- Incorporation of earlier themes

Designing the space

- Collaborative w/in and between group
- Built consensus
- Supportive - non judgemental
- Assumed risk
- Experientially themed

Key takeaways

- Challenged traditional design-thinking narrative
- Shifted maker design methodology (inclusion/safety)
- Foster independent learning, problem solving and critical thinking

Key takeaways

- Diversity honored and respected
- Attributes and identities tied to design of makerspaces
- Compromise and constructive dialogue
- Co-creation/co-research

Thoughts about evaluation

- Check your assumptions at the door
- Inclusivity is more than just a concept
- Safety is paramount
- Be flexible with methods and implementation
- Partnership between all parties

Thank you

scott@rockman.com
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Evaluation and Learning Resources for Informal STEM Programs

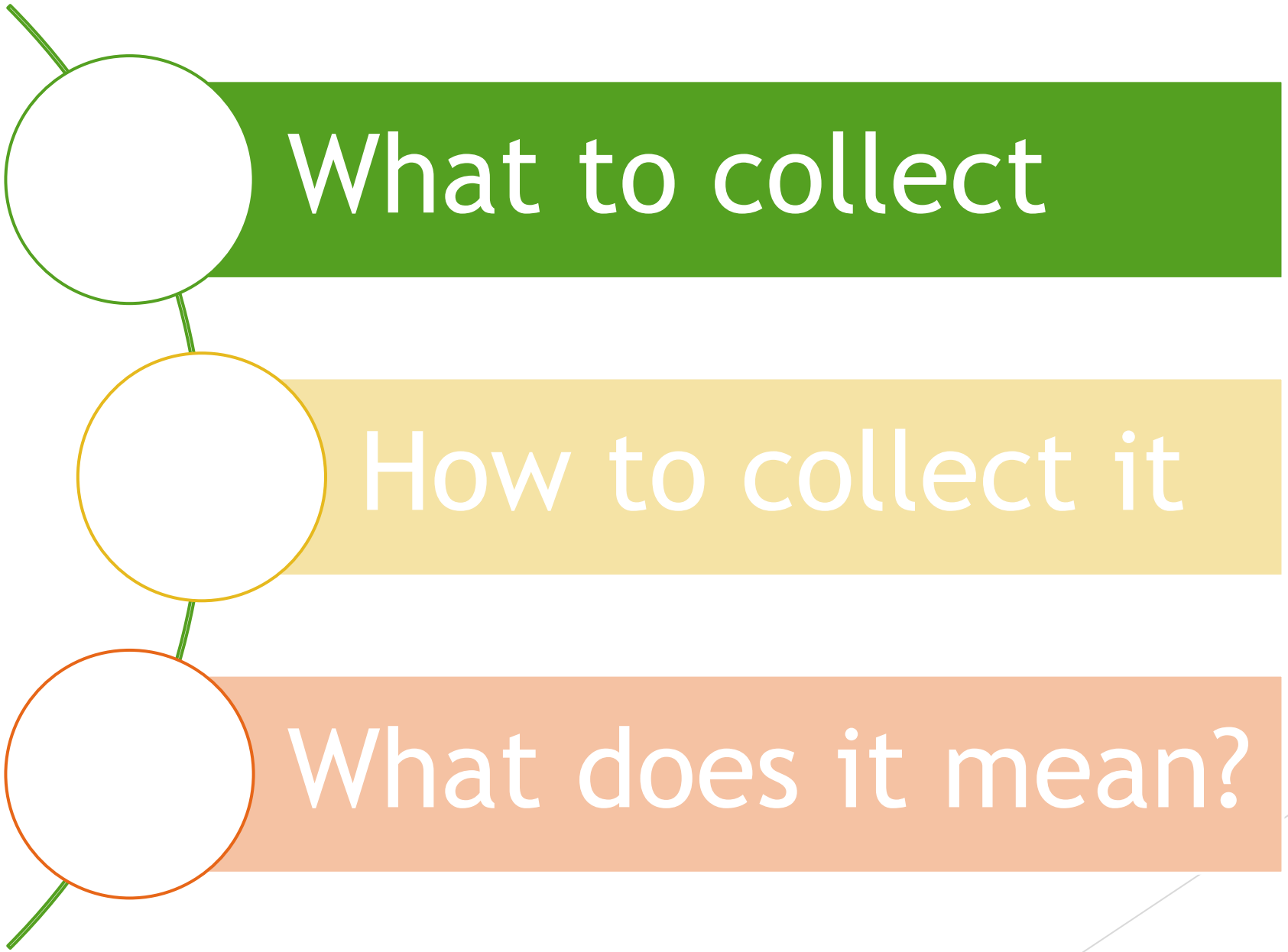
California Girls in STEM Network

October 2021

What to collect

How to collect it

What does it mean?


What to collect
How to collect it
What does it mean?

QUALITY PRACTICES - **What you can see happening in a program.** Sometimes called point-of-service quality, this is about measuring what can be observed during a youth program.

PROGRAM EXPERIENCES **What young people think and feel about their experience is important.** This data is based on the firsthand reports of people participating in the learning.

Consistent **Participation** + High **Quality** + Positive **Experiences** = Positive **Youth Outcomes**

YOUTH OUTCOMES **At the end of the day, this is about making a positive difference.** What difference did you intentionally design your program to make? Always start there. It might be learning new skills, changing behaviors, or building competencies. It might include success in formal education.

PARTICIPATION & ATTENDANCE **Who shows up, how often, and for how long reveals a lot.** The more often young people participate in high-quality afterschool, the better the outcomes.

QUALITY PRACTICES

Dimensions of Success, YPQA - STEM, ASQ

PARTICIPATION & ATTENDANCE

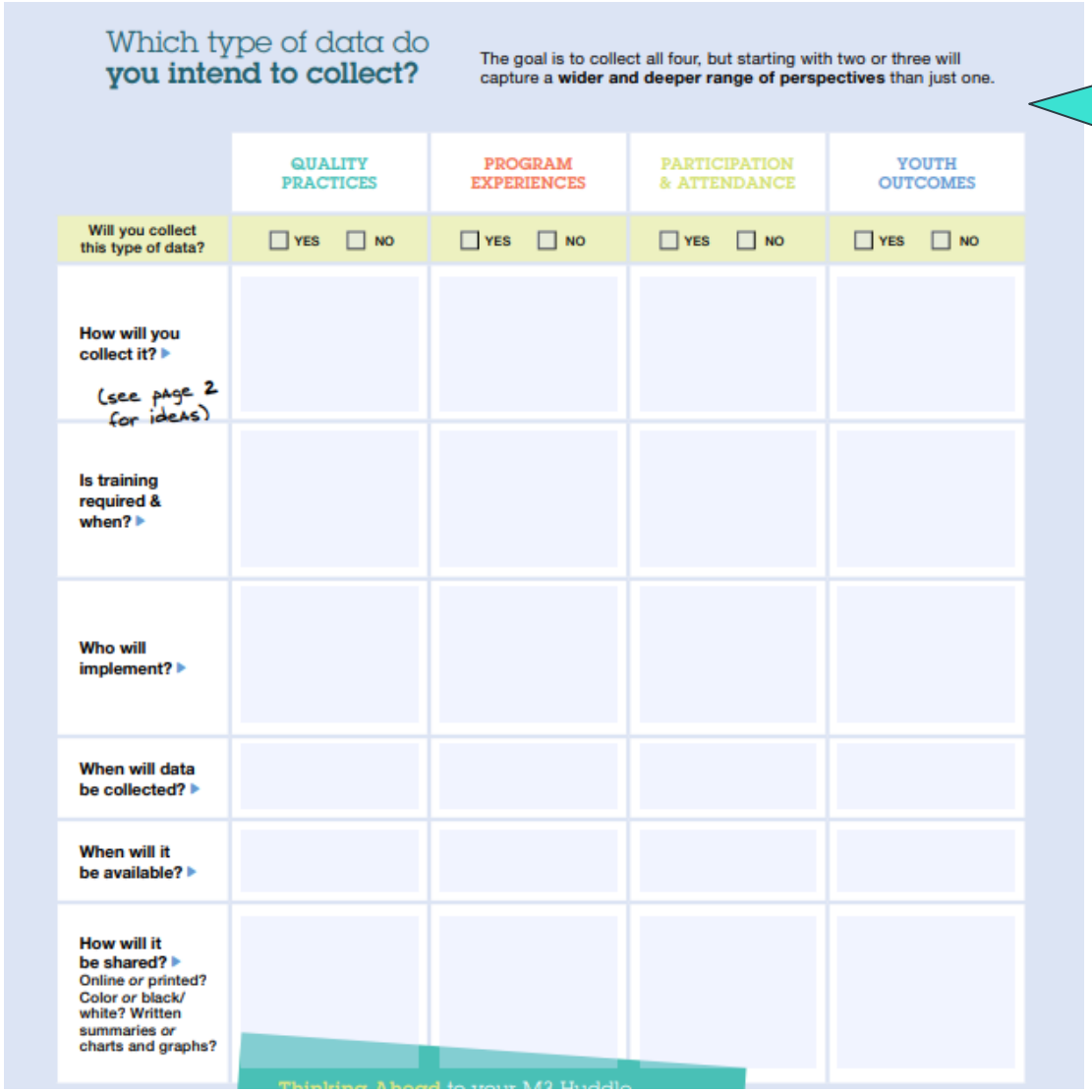
Cityspan, KidTrax, EZ Reports, Salesforce, spreadsheets

PROGRAM EXPERIENCES

Parent and youth satisfaction surveys, focus groups, Photostory, SAYO-Y, Hello Insight

YOUTH OUTCOMES

Internal experience evaluation or surveys, SAYO-Y, Holistic Student Assessment, Common Instrument Suite



Which type of data do you intend to collect?

The goal is to collect all four, but starting with two or three will capture a **wider and deeper range of perspectives** than just one.

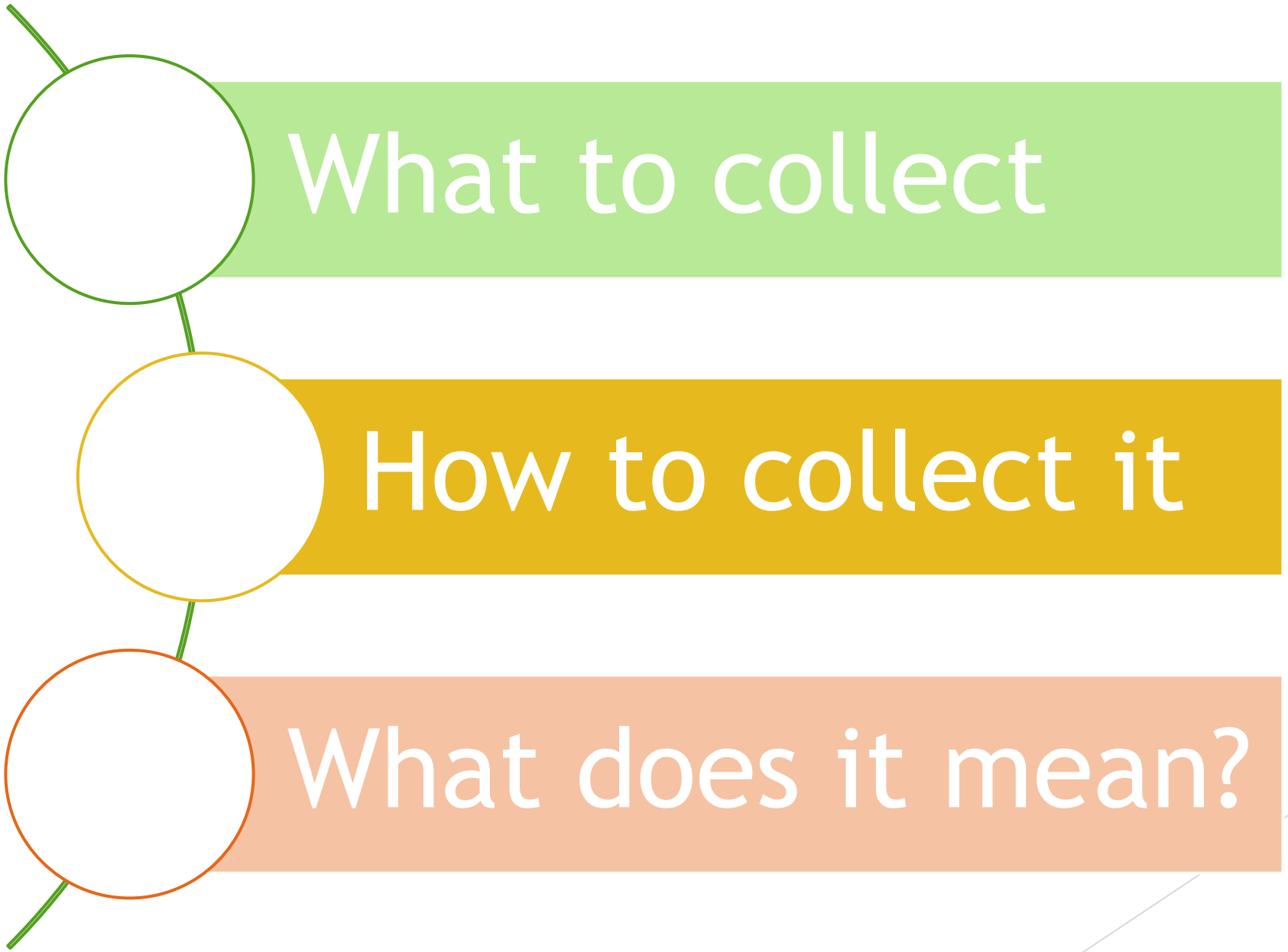
	QUALITY PRACTICES	PROGRAM EXPERIENCES	PARTICIPATION & ATTENDANCE	YOUTH OUTCOMES
Will you collect this type of data?	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO	☐ YES ☐ NO
How will you collect it? (see page 2 for ideas)				
Is training required & when?				
Who will implement?				
When will data be collected?				
When will it be available?				
How will it be shared? Online or printed? Color or black/ white? Written summaries or charts and graphs?				

Thinking Ahead to your M2 Huddle

The goal is to collect all four, but starting with two or three will capture a wider and deeper range of perspectives than just one.

As you build capacity and systems to support CPI, add in additional areas of data.

Choose a Tool


What to collect
How to collect it
What does it mean?

Use other people's stuff!

- Assessment Tools in Informal Science (ASTIS)
- InformalScience.org
  - Links to multiple STEM related tools
- Partnerships in Education and Resilience (PEAR)
  - Dimensions of Success
  - Common Instrument Suite

And if you are tired of surveys…

Four Corners

- Gauge attitudes or values for a group as people vote with their feet
- Bonus! Qualitative and quantitative data

Feedback Wall

- Helpful for gathering many participant's feedback over time.
- Can incorporate visual elements from the community or complement exhibit spaces

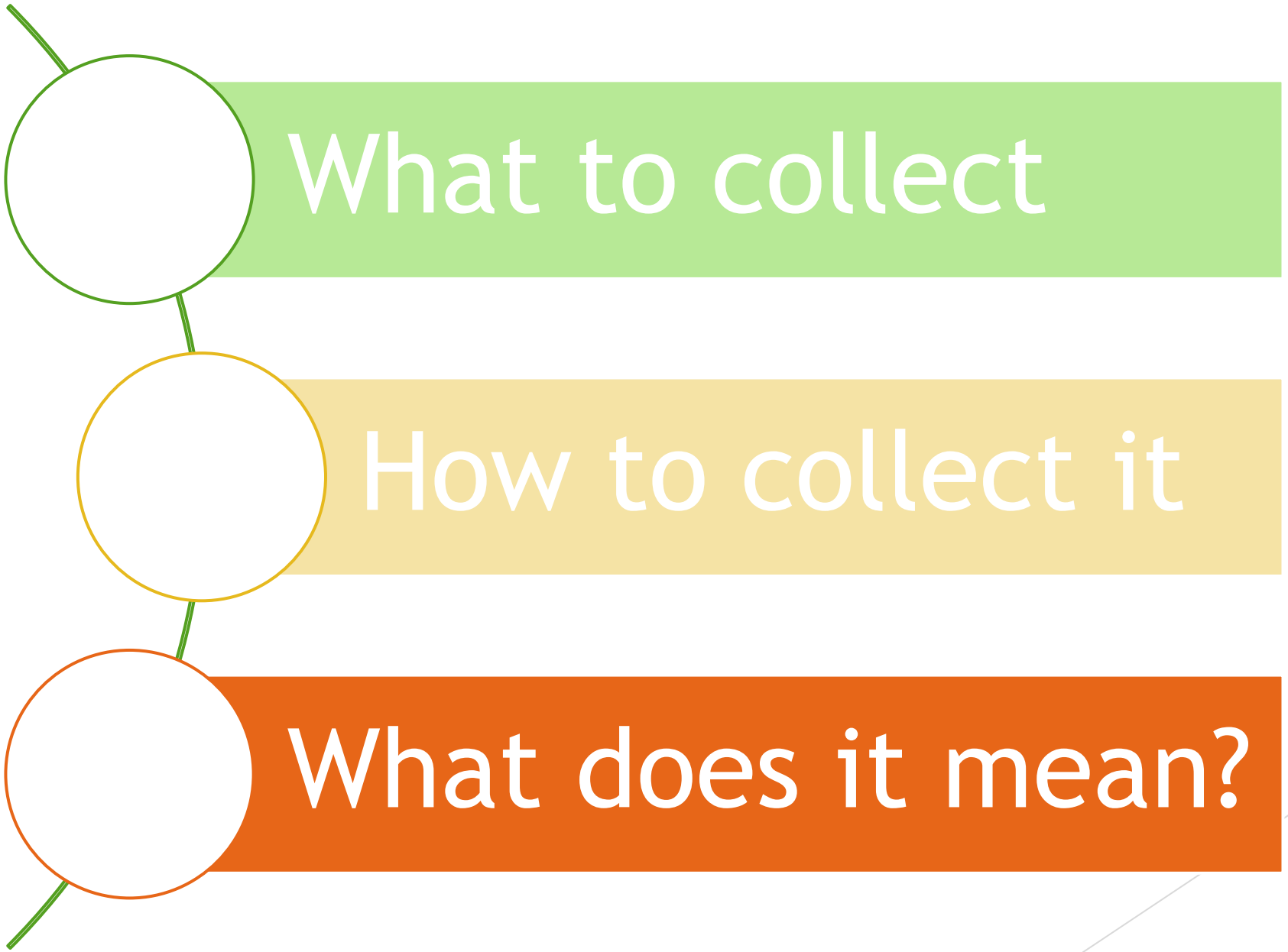
Selfie Station

- Great for getting short answer feedback to 1-2 questions
- Can connect to social media and hashtags

Selfie Station Reflection

Tag us on Twitter!
@public_profit

Because of this session, I plan to…


What to collect
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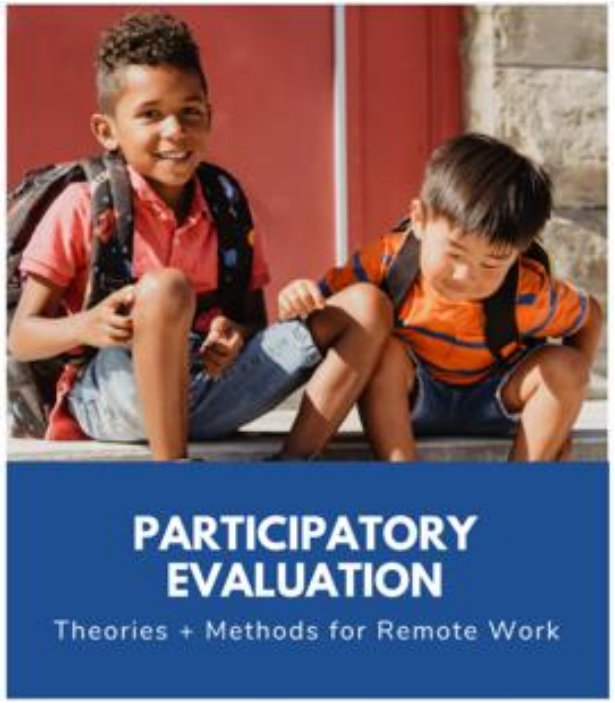
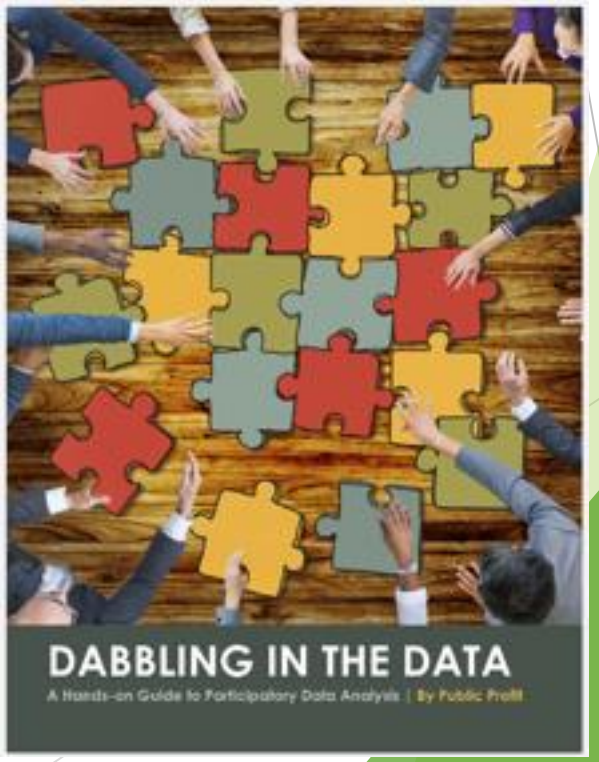

PARTICIPATORY
EVALUATION
Theories + Methods for Remote Work


FSG
Facilitating Intentional
Group Learning
A Practical Guide to 21 Activities


DABBLING IN THE DATA
A Hands-on Guide to Participatory Data Analysis | By Public Profit

Three Steps to Success!

SCAN

DIAGNOSE

PRIORITIZE

Stay in Touch!

School's Out Washington Bridge Conference – Oct 26-29

Join our mailing list for more updates!

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Q&A:

Please type questions in chat

Contact Information

- Kelly Grindstaff: Kelly.grindstaff@Berkeley.edu
- Scott Burg: scott@rockman.com
- Corey Newhouse: corey@publicprofit.net

- National Girls Collaborative Project
  - Kelly Reina: kreina@ngcproject.org
  - https://ngcproject.org/resources/webinararchive

California Girls in STEM Network

Focus on Girls in Making, Design, STEAM, and Engineering

- Carol Tang: carol@creativity.org
- https://aimscenter.org/events/2021-10-25-colloquium

aims CENTER

CHILDREI
CREATIVI
MUSEUM

OCT 25, 2021

GENDER-EQUITY IN STEM AND MAKING: RESOURCES AND RESEARCH-BASED PRACTICES

Carol Tang, Ph.D.

Executive Director

Children's Creativity Museum in San Francisco, CA

NOV 29, 2021

MAKER ED

DORA MEDRANO RAMOS

LEAD MAKER TRAINER, MAKER ED

Part of the MakerEd Making Spaces Program, supported in part by Cognizant.