Evaluating the Role of Museums in Sparking Female Science Self-Efficacy

Hsin Yi-Chien and Meghan Kroning, Exploratorium
Kari Ross Nelson, Thanksgiving Point
Session Outline

Why Study Science Self-Efficacy?

All About Cultivating Confidence
  Activity & Discussion: Concept Maps
  Reflections

All About Girls Who Code
  Activity & Discussion: Draw a Scientist
  Reflections
Why Does Science Self-Efficacy Matter?

Strong Predictor for:

✓ Academic performance
✓ College degree choice
✓ Career path
Cultivating Confidence

Hsin-Yi Chien, Researcher
Meghan Kroning, Manager
Emerging Adults

Who are they?
- 18 - 29 years old
- Never married
- No children

Why this group?
- Between life milestones
- Fewer responsibilities
- Seeking identity-forming experiences
Study #1: Research on Emerging Adult Learners

Pre

Svy

Play in Exploratorium!

Post

Svy & Intvw

3 months

Svy & Intvw
REAL: Self-Efficacy by Gender

![Graph showing self-efficacy levels over time for men and women.](image-url)
REAL: Self-Efficacy by Gender

Interaction effect: p<.05

Lower Self-Efficacy

Higher Self-Efficacy

Pre
Interaction effect: p<.05
3-month Follow Up

Men (N=74)

Women (N=78)
H1: Confounded gender and self-efficacy

Women had lower initial self-efficacy, and so were more likely to get a lasting boost.

H2: Activation

Women sought out more science experiences.

H3: Broadened science concept

Women expanded their idea of what counts as science.

Study #2: Cultivating Confidence

RQ1: Validating REAL findings
Can we replicate the results found in REAL?

RQ2: Testing Activation and Broadened Science Concept Hypotheses
What are the mechanisms by which a science museum visit might affect emerging adults’ self-efficacy?

RQ3: Exploring moderating influences
Is the impact of a science museum visit moderated by (a) gender and/or (b) initial levels of science self-efficacy?
New Methods & Challenges

- Recruit **Non-Visitors** to participate via a recruiting firm
- Adopted the **Randomized Control Trial** design
- Utilized **Concept Map** as a tool for data collection

<table>
<thead>
<tr>
<th>Pre</th>
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<th>3 months</th>
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<td>Svy</td>
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<td>Go to Exploratorium</td>
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Concept Map as a Measurement Tool

**Step 1:** Introduce the concept map

**Step 2:** They draw a concept map

**Step 3:** “Can you please walk me through your concept map?”

**Step 4:** “Now that you’ve made your map, I want to ask you to add any activities you’ve engaged in that fit with your concept map of science.”

**Step 5:** “So, how would you sum up your definition of science?

**Step 6:** “Does seeing science this way affect your confidence in learning science?”
Draw your concept map of science!

A concept map is a way to visually represent your way of thinking. Start with “science”, and go from there!
Activity #1b - 3:00 minutes

Pair up! Ask each other:

“Walk me through your concept map?”

“So, how would you sum up your definition of science?”
Discussion #1

- Did the concept mapping activity help you better articulate *your* definition of science?
- What do you see as the strengths and weaknesses of this tool?
- What projects can you see it being useful in, or not?
Reflections: Cultivating Confidence

- Measurements themselves could affect participants’ views about the construct
  → Experiment with alternative ways of measuring
- A given measurements may not work equally well for all.
  → Consider more inclusive ways of measuring
- Alternative measurements may be more challenging to use and analyze
  → Provide training .... “do no harm”
  → Be mindful of researchers’ bias(es), especially if a participant’s concept map does not fit with researchers’ mental schema
Girls In STEM

Kari Ross Nelson,
Research and Evaluation Associate
Women in Science Initiative

Goals:

1. Increase interest in Women in STEM.
2. Increase girls’ confidence in STEM (and boys’ attitudes toward girls in STEM).

Programs:

- Girls Who Code Club
- Girls in Science Club
- Training for Facilitators to interrogate their own biases
- “Women Making a Difference” Institute-wide emails highlighting women in STEM
Girls Who Code is on a mission to close the gender gap in technology and to change the image of what a programmer looks like and does.
Girls Who Code at Thanksgiving Point

EQ1: Does the program increase participants’ science self-efficacy?

- Are girls feeling more likely to join other STEM programs?
- After the program, how confident do the participants feel about:
  - their own STEM abilities? (self-efficacy)
  - joining other STEM-related activities not specific to girls?
- Did hearing from role models help?

EQ2: Do participants’ perceptions of scientists and science change over the course of the program?
Activity #2  – 5 minutes

Draw A Scientist!
Scoring the ‘Draw a Scientist’ Test

- Lab Coat (usually but not necessarily white)
- Eyeglasses
- Facial Hair (e.g., beards, mustaches, or abnormally long sideburns)
- Symbols of Research (e.g., scientific instruments and laboratory equipment of any kind)
- Symbols of Knowledge (e.g., books and filing cabinets)
- Technology: the “products” of science
- Relevant Captions (e.g., formulae, taxonomic classification, the “eureka”! syndrome)

Scoring the ‘Draw a Scientist’ Test

Fig. 1. The two drawings produced by the same child when asked to (a) ‘Draw a picture of a scientist’; and (b) ‘Do a drawing which tells me what you know about scientists and their work’.

Scoring the ‘Draw a Scientist’ Test

- Male Gender
- Caucasian
- Indications of Danger
- Presence of Light Bulbs
- Mythic Stereotypes (e.g., Frankenstein creatures, Jekyll/Hyde figures, “Mad/Crazed”)
- Indications of Secrecy (e.g., signs or warning of “Private,” “Keep Out,” “Do Not Enter,” “Go Away,” “Top Secret”)
- Scientists Doing Work Indoors
- Middle-aged or Elderly Scientist

Girls Who Code at Thanksgiving Point

Pre:
- Girl scientist with panda buns
- Making a potion to shrink people
- Plans to shrink her little brothers because they are annoying

Post:
- Would draw her with a computer and programming robots
Pre:
- Girl scientist doing explosions
- In a lab

Post:
- Would draw her with a computer, “because I know what coding is about now.”
Girls Who Code at Thanksgiving Point

Pre:
- Girl scientist creating new chemicals
- Goggles to be safe
- Says she likes to do science, “the exploding kind.”

Post:
- Would add other scientific things like a tablet and “inspirational signs in the background with encouraging words for scientists.”
Girls Who Code at Thanksgiving Point

Pre:
- Girl scientist, kind of young
- Studies animals, just not insects

Post:
- Would change her eyes so they don’t look like she’s rolling them.
- Would make her legs and hair more proportional.
Reflections: Girls Who Code

- Almost always females, so that’s a great head start!
- Not often themselves - hard to say in post “Would you make it you?”
- Very chemistry-based settings.
- Sometimes girls get silly.
- Small sample sizes - which is okay if using qualitatively, but still harder to see trends.
- Not identifying mechanisms of program that are successful in these attitude changes.
Discussion #2

- What do you see as the strengths and weaknesses of this tool?
- What projects can you see it being useful in, or not?
Thank You!

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Appendix

Presentation with Speaker Notes
Hi everyone! Welcome. We’re about ready to get started. Thank you for coming to our session! We’re very excited to see you all here, and would like to start by introducing ourselves and share a little bit about how we came to work on girls in STEM projects.

(MK)
(HC)
(KRN)
In this session, we'll present on two studies (active and ongoing) that are examining the role of informal science learning in increasing gender equity in STEM by enhancing science self-efficacy (SSE) in learners: in particular, young women and girls.

Our focus today will be on the open-ended methods we’re using to measure and evaluate SSE: their design, challenges, benefits, and how they might be improved.

We’ll start by giving an overview of what SSE is and why it matters. Then we’ll go into our projects, the first being *Cultivating Confidence* from the Exploratorium, and the second Girls Who Code at Thanksgiving Point. These will be somewhat rapid-fire share-outs because we’re also making time for you to actually try out the open-ended drawing-based methods each project is using.

We’ll have discussion time after each activity, and we’ll also share reflections on what our project teams learned that we’d like to share as lessons that will hopefully be of use to you as you consider the utility of these methods to your current and future projects.

### Session Outline

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Gender equity in STEM has always been an important goal for the science education community. What does SSE have to do with that?

Self-efficacy is, in a nutshell, a person’s belief in their own ability do and learn. ‘I am capable of doing.’ ‘I am capable of learning.’ People who agree strongly with these statements would be said to have high self-efficacy. People who disagree would be said to have lower self-efficacy. And so, science self-efficacy (SSE) is, then, a person’s confidence in their own ability to do or understand science. This might look like being interested in science classes, feeling confident in being able to understand what a scientist being interviewed on the news is saying, or just being comfortable with using tools around the house.

SSE is an important topic for us to study in the field of free choice learning because research in the field of formal education has already given us abundance of evidence that shows the vital role SSE plays in supporting a person’s success and performance in science learning as well as their motivation and interest to engage in a science-related college major/career. Essentially, SSE is what smooths or creates a path that someone can comfortably or securely walk down towards science – whatever science that is that interests them!

But there’s a problem. Literature also shows that women and girls often possess FAR lower confidence in their
science abilities than their male counterparts. This discrepancy begins around the ages of 8-13, continues into young adulthood, and has far-reaching impacts on degree and career choices.

In this regard, increasing women’s and girls’ SSE is an important step towards achieving gender equity in STEM.

This is where informal learning environments enter the equation—free choice learning environments offer a relaxed, non-competitive environment in which learners get opportunities for positive sources of SSE without adverse academic or professional consequences.

Some prior studies have found that closed-ended assessments bias towards men and boys, and suggested that the field might need better alternatives. This is where the open-ended methods come into play—specifically, in our cases, drawing-based activities.

Without further ado, I’ll pass it off to HC to share our work on the first method interest, concept maps, at the Exploratorium!
Today, I am hoping to quickly describe our research study, called Cultivating Confidence, and to share with you some methodological challenges that we have encountered during our study, and I am hoping that we can use it as a case study to collectively brainstorm what creative research and evaluation methods might benefit our field.

(15 mins for the presentation)
So some context about Cultivating Confidence. Cultivating Confidence is inspired by one of the Exploratorium’s prior project called REAL (Research on Emerging Adult Learners). In Cultivating Confidence and REAL, we seek to answer this question: How does a visit to a science museum affect emerging adult learners.

We define emerging adults as people who are 18-29 years old, never married, and have no children. We decide to focus on this group because our team believes that young adulthood - the stage between adolescence and full maturity—may represent a distinct life stage marked by freedom from responsibility for others and represents a lengthy process of identity development. Experience during this stage might have lasting impact on identity development. We are particularly interested to see and whether informal science education experiences, such as visiting a science museum, might influence this group of people’s SSE.
As mentioned, the Cultivating Confidence is inspired by the REAL project (Research on Emerging Adult Learners). In the REAL project, we used a one group pre-test and post-test design to assess whether a trip to the Exploratorium affected young adult participants’ SSE.

We recruited young adult visitors when they were entering the Exploratorium and asked if they would like to participate in the REAL study. And we used a closed-ended scale to measure participants’ science self-efficacy before they entered the Exploratorium, immediately after their visit to the Exploratorium, and 3 months after their visit to the Exploratorium.
Here a graph summarizing what we found in the REAL study.

We can see that men's SSE increased immediately after their visit to the Exploratorium; however, men’s SSE dropped back to their pre-visit level 3 months after their visit to the Exploratorium. These results suggest that, while a trip to a science museum had a positive short-term impact on our male participants, there was no significant difference between the men's SSE before and three months after their visit to the Exploratorium.

As for women, women's SSE increased significantly after their visit to the Exploratorium and then remained at a similar level three months after the visit. This suggests that a single museum visit had both short- and long-term positive effects on women's science self-efficacy.
In conclusion, the REAL study found that while women entered the museum with a lower SSE than men, they experienced a significant increase in their SSE over the course of the study. In addition, despite the difference in their pre-visit level of SSE, women's SSE became comparable to men's three months after their visit to the Exploratorium, as evidenced by the overlap between the error bars.

This suggests that a single museum visit had a positive long term impact on women's SSE and might help reduce the gap between men's and women's science self-efficacy in the long run.
However, the REAL study didn’t really investigate why a science museum visit might affect men and women differently. We come up with three hypotheses:

First, there could be a confound between gender and pre-visit level of science self efficacy. Indeed, in the REAL study, women tended to have lower initial SSE measured at the pre-test. So it is likely that a trip to a science museum had more pronounced impact on participants with a lower initial SSE, and gender, when holding initial self-efficacy constant, might have no influence at all.

Second, we hypothesize that women, or participants with lower initial science self efficacy, experience more pronounced long-term positive effect of a single science museum visit because this positive experience activates them to seek out more science experiences.

Alternatively, it is also likely that a trip to science museum broaden women’s or low SSE participants’ view about what could count as science, and this broadened science concept help them gain science self-efficacy by allowing them to realize their ability to excel activities that they previously did not view as science.

Competing Post-REAL Hypotheses

H1: Confounded gender and self-efficacy
Women had lower initial self-efficacy, and so were more likely to get a lasting boost.

H2: Activation
Women sought out more science experiences.

H3: Broadened science concept
Women expanded their idea of what counts as science.
Therefore, Cultivating Confidence seeks to test these questions unanswered in REAL.

Specifically, Cultivating Confidence aims to explore these research questions:

RQ1: Will Cultivating Confidence replicate the results found in REAL? How does a visit to a science museum influence emerging adults’ SSE (a) immediately after the visit and (b) 3 months after the visit?

RQ2: What are the mechanisms by which a science museum visit might affect emerging adults’ self-efficacy? Specifically, we will be looking at if a trip to science museum activate participants to engage in more science activities later on and/or if this experience broadens their science concept.

RQ3: To what extent does the short-term and long-term impact of the visit differ as a function of (a) gender and/or (b) initial level of science self-efficacy?
Let turn our attention to the study design of the Cultivating Confidence study. There are 3 new methods we employ in Cultivating Confidence:

As mentioned before, the REAL study noticed that there might be a confound between gender and initial SSE; that is, female participants in the REAL study tended to have a lower pre-visit SSE than male participants. Cultivating Confidence attempts to untangle this confounding relationship between gender and people’s initial level of SSE by trying to recruit participants of diverse backgrounds so that our sample would include women with a high initial level of SSE, women with a low initial level of SSE, men with a high initial level of SSE, and men with a low initial level of SSE.

To achieve this, we partner with a recruitment firm to help us recruit non-visitors to participate in our study, and we use quota sampling to make sure that our final sample would be representative of the ethnic diversity of the Bay Area. Our hope is that recruiting non-visitors would allow us to (1) get a sample that has a wider range of pre-test SSE and (2) increase the ecological validity of our study. Thus far, of the 200+ participants we recruited, we only have 28...
people who are in science-related occupations, and 75 who we have identified as having a science-related degree.

In Cultivating Conference, we employ a Randomized Control Trial design to help us more rigorously examine the hypothesized causal effect, and we randomly assign participants to either the control or the treatment condition. Participants in the Treatment condition are asked to go to the Exploratorium first, and once they complete all the study measurements, they are given free movie tickets. Participants in the Control condition are asked to go to the movie first and they are given free tickets to the Exploratorium once they complete all the study procedures.

Again we are assessing SSE three times throughout the study - before, after, and three months after participants visited the venue they are assigned to. Then we will compare changes in self-efficacy between the movie and the museum conditions. However, the use of a RCT design requires us to utilize deception and to come up with a good cover story so that participants assigned to either the control or the treatment condition won’t feel weird when being asked to take our surveys and interview that focus on understanding their SSE, science activity participation, and their views about science. In Cultivating Conference, the cover story that we use is that we told participants that a group of science museums and movie producers aims to conduct a study to help them better develop movie-related science exhibitions targeting young adults. Participants will be debrief about the true study objectives after they complete the whole study process.

Finally, in addition to using close-ended scales to measure participants’ SSE and their concepts about science in the repeated surveys, we asked participants to draw their concept map about science during their interview 3 months after their visit to the Exploratorium or the movie. We would like to be transparent with you that we did not consider concept map as a measurement tool in the beginning of our project. Instead, we relied solely on a closed-ended scale which presents participants with a list of activities, such as eating and rock collecting, and asks them, in their minds, which of these activities could involve science. And we noticed that simply asking these close-ended questions could influence participants’ views about science, and we were seeing some internal risk of validity associated with using such a measurement. Therefore, we decided to experiment with alternative ways of measuring, and we landed with using concept maps as a less-leading tool to measure people’s concept of science.
Here are the steps for our concept mapping activity…

**Concept Map as a Measurement Tool**

**Step 1:** Introduce the concept map

**Step 2:** They draw a concept map

**Step 3:** "Can you please walk me through your concept map?"

**Step 4:** “Now that you’ve made your map, I want to ask you to add any activities you’ve engaged in that fit with your concept map of science.”

**Step 5:** “So, how would you sum up your definition of science?"

**Step 6:** “Does seeing science this way affect your confidence in learning science?”
Activity #1a – 2:30 minutes

Draw your concept map of science!

A concept map is a way to visually represent your way of thinking. Start with “science”, and go from there!

HC

(2:30, April Come She Will, Carbe and Durand)
Activity #1b  -  3:00 minutes

**Pair up!** Ask each other:

“Walk me through your concept map?”

“So, how would you sum up your definition of science?”

HC

(3 minutes, Lean On, Nylonwings)
Discussion #1

- Did the concept mapping activity help you better articulate your definition of science?
- What do you see as the strengths and weaknesses of this tool?
- What projects can you see it being useful in, or not?
Now I would like to close my presentation with some reflections.

First, as I mentioned earlier, we noticed the closed-ended question we used in the survey, which asked participants to reflect on a list of activities including those not generally considered science-related, may have prompted participants to expand their concept of science. This shows that measurements themselves could affect participants’ views about the construct, and it’s hence important to experiment with alternative ways of measuring to reduce this internal validity risk.

Second, when I started to research on the pros and cons of the concept map as a measurement tool, I came across some studies that showed that close-ended questions on self-efficacy or science-related measures sometimes favor males. This could suggest that a particular measurement format may not work equally well for all, and it’s important for researchers and evaluators to consider more inclusive ways of measuring.

Finally, we noticed that these alternative, non-conventional, ways of measuring might be more challenging for participants to use and for researchers and evaluators to analyze. We’ve learned that it’s important to provide training to the respondents before we actually measure the construct of interest and that it’s crucial that we pay attention to participants’ feelings during the process. We had a few participants expressing that they felt frustrated
during the concept map activity, and we made an intentional decision that it’s okay to stop the interview so as to reduce harm to the participants.

In addition to being mindful of participants’ feelings during the concept mapping process, we also notice that, given that concept map is a more open-ended measurement tool, it sometimes require researchers’ subjective interpretations to make sense of the concept map artifacts, especially when a participant’s concept map of science does not fit with participants’ mental model/scheme about science. Hence, it’s crucial that we as researchers are mindful of our biases and document and report them.

These are some of the major takeaways from our experience using the concept mapping tool. Now please welcome Kari to share her work on Girls in STEM.
Kari
Women in Science Initiative

Goals:
1. Increase interest in Women in STEM.
2. Increase girls’ confidence in STEM (and boys’ attitudes toward girls in STEM).

Programs:
- Girls Who Code Club
- Girls in Science Club
- Training for Facilitators to interrogate their own biases
- “Women Making a Difference” Institute-wide emails highlighting women in STEM
One activity in the Women in STEM initiative is the Girls Who Code club.

Clubs are free programs for 3rd-5th and 6th-12th grade students to join a sisterhood of supportive peers and role models using computer science to change the world. Clubs are completely free and offer fun activities through a flexible curriculum that adapts to your unique needs. Clubs can take place after school, on weekends, or during the summer, and they can be held in-person or entirely online. The national organization provides the curriculum and organizations apply to host a club in their community.

7-10 week program, depending on how it is structured.

Meet weekly for 60 minutes

10-15 girls in each class - Free program - challenge because can be lack of commitment/investment

Taught by female instructors, both our own educators and volunteers in the community - women who work in coding jobs
Girls Who Code at Thanksgiving Point

EQ1: Does the program increase participants' science self-efficacy?

- Are girls feeling more likely to join other STEM programs?
- After the program, how confident do the participants feel about:
  - their own STEM abilities? (self-efficacy)
  - joining other STEM-related activities not specific to girls?
- Did hearing from role models help?

EQ2: Do participants' perceptions of scientists and science change over the course of the program?

Worked with the head educator to articulate goals. In our time together today, I want to focus on this last one.
Activity #2 – 5 minutes

Draw A Scientist!

5 min (Clocks, Coldplay)
Scoring the ‘Draw a Scientist’ Test

- Lab Coat (usually but not necessarily white)
- Eyeglasses
- Facial Hair (e.g., beards, mustaches, or abnormally long sideburns)
- Symbols of Research (e.g., scientific instruments and laboratory equipment of any kind)
- Symbols of Knowledge (e.g., books and filing cabinets)
- Technology: the “products” of science
- Relevant Captions (e.g., formulae, taxonomic classification, the “eureka”! syndrome)

Draw a scientist test

The objective of Chamber’s study was to determine at what age children first develop distinctive images of the scientist. In addition a preliminary attempt was made to clarify the influence of population variable such as “socioeconomics, intelligence, sex, and anglophone/Francophone culture” on the formation of the standard image. They also looked for specific variations of the stereotype which might indicate the early development of social and psychological attitudes toward science and technology.

The Draw a Scientist Test (Chambers, 1983) consists of asking the subjects to 'draw a picture of a scientist'. Part of the attraction of the procedure is that it does not require verbal skills and so can be used with quite young children (Schibeci & Sorensen, 1983). Use of the technique has produced consistent results.

The drawings have normally been scored for the presence of indicators such as lab coats, eye glasses, facial hair which reflect what is seen as a stereotyped image of the scientist.

What is your score?
Chambers ID’d some strengths and weaknesses of the DAST for identifying and assessing stereotypes in children:

- Because DAST does not rely on a verbal response, it can be utilized at an earlier age than other attitude measuring test. This factor also enables comparison of different language groups w/o significant translation problems.
- DAST is easier to administer than most tests; however, a number of interpretive difficulties may arise.
- DAST is probably more useful in identifying than in measuring attitudes. Therefore, it may ultimately prove more useful in the construction of hypotheses than in the testing of them.
Symington and Spurling in 1990 published a very short commentary on how wording of the question can produce different drawings.

“In our view, the use of drawing continues to have potential as a tool to exploring the ideas of young children. However, researchers need to investigate how the children interpret the instruction they are given.”

How do you think your drawing might have changed if I had worded the prompt differently?
Scoring the ‘Draw a Scientist’ Test

- Male Gender
- Caucasian
- Indications of Danger
- Presence of Light Bulbs
- Mythic Stereotypes (e.g., Frankenstein creatures, Jekyll/Hyde figures, “Mad/Crazed”)
- Indications of Secrecy (e.g., signs or warning of “Private,” “Keep Out,” “Do Not Enter,” “Go Away,” “Top Secret”)
- Scientists Doing Work Indoors
- Middle-aged or Elderly Scientist


In 1995 Finson, Beaver, and Cramond added to Chamber’s original list and provided guidelines for a standardized approach to administering and scoring a Draw A Scientist Test.

Has your score changed?

In some of the literature, the DAST has been used as a pre-post measure. We decided we’d give it a try for that evaluation question of Do the participants’ perceptions of scientists and science change over the course of the program?
**Girls Who Code at Thanksgiving Point**

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| ● Girl scientist with panda buns  
● Making a potion to shrink people  
● Plans to shrink her little brothers because they are annoying | ● Would draw her with a computer and programming robots |

Round one: Pre/Post messy. Numbers alone not very telling. Small data set.
Round two: per recommendation at a VSA session last year, used just one drawing, asked “what would you change” as a post.

Using more qualitatively, drawing becomes an centerpiece for conversation.

Examples
Girls Who Code at Thanksgiving Point

Welcome!

Pre:
- Girl scientist doing explosions
- In a lab

Post:
- Would draw her with a computer, “because I know what coding is about now.”
Girls Who Code at Thanksgiving Point

Pre:
- Girl scientist creating new chemicals
- Goggles to be safe
- Says she likes to do science, “the exploding kind.”

Post:
- Would add other scientific things like a tablet and “inspirational signs in the background with encouraging words for scientists.”

Shows softer, collegial human side of science.
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Not all show relevant changes
Reflections: Girls Who Code

- Almost always females, so that’s a great head start!
- Not often themselves - hard to say in post “Would you make it you?”
- Very chemistry-based settings.
- Sometimes girls get silly.
- Small sample sizes - which is okay if using qualitatively, but still harder to see trends.
- Not identifying mechanisms of program that are successful in these attitude changes.
Discussion #2

- What do you see as the strengths and weaknesses of this tool?
- What projects can you see it being useful in, or not?
We hope your time with us today offer you some new ideas of contemplations on how we as practitioners can come together to design and improve measures to evaluate gender equity in STEM within science learning spaces. Our understanding of SSE has a LONG way to go, not only in the area of gender identity but also in how gender identity and SSE intersect with culture, race and ethnicity, class, geographic location, age, and so much more; so we’re eager to continue sharing and learning with each other! Please connect with us if you’re doing or thinking about a SSE project, we’d love to hear more about your work!