Objectives for Today

Introductions

Overview of STEM Innovation Hubs

OC Data Collection Plan
  - Program quality observations
  - Student outcomes

Questions & Answers

Goal: To provide an interactive forum for discussion of the OC/Harvard STEM Innovation Hub
WHAT IS THE PEAR INSTITUTE?

- Integrates research, theory, and practice
- Takes a developmental approach to the study of new models of effective afterschool programming

www.pearweb.org/
PEAR’S NATIONAL REACH: STATES USING TOOLS

States using PEAR STEM Tools and Services
BENEFITS OF USING COMMON TOOLS

• Psychometrically strong and standardized

• Specific enough to help improve program quality

• General enough to apply to a range of program types (provides a common language)
PEAR/HARVARD STEM INNOVATION HUBS (2015-2017)
LEARNING GOALS FOR THE HUB

• Classroom/program similarities and differences
  – What strengths and challenges will be observed OC STEM classrooms?

• Changes in students’ STEM-related attitudes
  – How much, if at all, has participation in STEM lessons/activities changed students’ feelings toward STEM and 21st century skills?

• Group similarities and differences
  – How are different groups of students impacted by afterschool STEM programming?
DATA SOURCES

Program Quality
(Dimensions of Success)

Student Outcomes
(Common Instrument)
Dimensions of Success (DoS): Program Quality Observations
Dimensions of Success (DoS) Framework

**Features of the Learning Environment**
- Organization
- Materials
- Space Utilization

**Activity Engagement**
- Participation
- Purposeful Activities
- Engagement with STEM

**STEM Knowledge & Practices**
- STEM Content Learning
- Inquiry
- Reflection

**Youth Development in STEM**
- Relationships
- Relevance
- Youth Voice

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As DoS observers, you will complete up to 5 observations (classroom Grades 4-8).

No interference with regular day
- DoS Professionals observe STEM activities quietly in the background

Constructive feedback given!
- A brief report will be provided back to the teacher

Help understand on hub-level
- Common language across all schools/programs will help hubs understand outcomes
When reaching out to nearby schools and OST programs, please be sure to consider the following:

- While DoS can be used to observe classrooms/activities from 1st - 12th grade, **DoS is best suited for use in 4th - 8th grade activities**, and should not be used in pre-school settings.
- Activities should be a minimum a 30 minutes long to a maximum of 2 hours.
- DoS is not suited for unstructured activities without a facilitator (e.g., self-guided museum tours).
- Remind the teacher or facilitator that the observation will not interfere with the flow of their activity.

Double-check the date and time 24 hours before, and have a “day-of” contact number for last-minute changes.
BEFORE YOUR DoS OBSERVATION

• Arrive at LEAST 15 minutes early to find your spot to observe and to introduce yourself to the facilitator. If the facilitator asks you to introduce yourself to the students, tell them:
  – “I heard you are doing some cool STEM activities and I wanted to come in to observe how they work and what kinds of things you get to do here. You’ll see me taking notes—I’m jotting down things about the activity itself and not about individual people in this room, so don’t worry. I’ll try to stay out of your way as much as possible. Thanks!”

• Remind the facilitator that you are not there to help or to teach, but simply to observe. You will not be able to engage if prompted to do so.
DURING YOUR DoS OBSERVATION

• Take detailed field-notes as the activity is enacted. Based on your certification training, note quotes and examples, timings, and interactions that will help build the case for particular ratings on each dimension. Don’t worry about ratings as you take notes—only focus on getting the evidence you need.

• Do not engage the students with questions or suggestions. Do not assist the facilitator or alter the course of the activity. If students ask you questions, direct them to their facilitator.
AFTER YOUR DoS OBSERVATION

• **Go to a quiet place** at the site or elsewhere where you can immediately review your field-notes and apply the rubric.

• **Start assigning ratings and writing detailed evidence** with specific quotes, interactions, examples that defend that rating. Be sure to keep opinion and suggestions OUT of your evidence. Only stick with what you saw/heard.

• **Remember, you can give suggestions/feedback** during the coaching conversation (see tools to support this at [http://pearweb.org/tools/dostool.html](http://pearweb.org/tools/dostool.html)).

• **Complete ratings/evidence within 24 hours** of the observation in your DoS rating sheet for live observations and submit your observation online.

• **Be sure to save everything in your rating sheet** on your computer until it is fully uploaded.
After you have finished writing up your DoS observation, upload your observation to your organization’s customized SurveyMonkey link!

You can upload your In-School DoS observations here:

www.surveymonkey.com/r/OC_SECONDSMSTEM_DoS_IN_SCHOOL_Observations_2017

You can upload your OST DoS observations here:

Common Instrument (CI): Student Outcomes
THE COMMON INSTRUMENT

The Common Instrument Survey

- Brief to administer
- Allows for pre-post analysis
- Provides usable feedback
- Valid and reliable
- Flexible use across contexts

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Dear student,

Your school or program would like you to take a survey that asks you questions about how you feel about Science, Technology, Engineering, and Math (STEM) – especially how you feel now compared to how you felt at the beginning of the school year.

We want to learn about your experiences with STEM activities everywhere you do or think about STEM: in school, after school, on TV, on the internet, in museums, on the street, or anywhere else you may be.

Please remember these things:
- This survey is not a test, and there are no "right" or "wrong" answers.
- This is all about your experience, thoughts, and feelings.
- This survey is voluntary, and you can stop at any time.
- Please take your time and answer the questions as honestly as you can.

We use the survey to help schools and programs become more interesting and exciting, but we do not share your answers. If you have any questions, please raise your hand and ask for help.

Thank you for participating and sharing your thoughts about STEM!
The survey asks students to think about how they feel they have changed because of their participation.

- Do they feel the same or different about science-related things?

<table>
<thead>
<tr>
<th>Thinking about how you feel TODAY compared to the BEGINNING of the school year...</th>
<th>Much Less About the</th>
<th>Less</th>
<th>More</th>
<th>Much More Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinking about how you feel TODAY compared to the BEGINNING of the school year...</td>
<td>Much Less</td>
<td>About the</td>
<td>More</td>
<td>Much More Now</td>
</tr>
<tr>
<td>Now</td>
<td>Less</td>
<td>Same</td>
<td>More</td>
<td></td>
</tr>
<tr>
<td>1. I get excited about STEM.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. I like to participate in STEM projects.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
**SURVEY ADMINISTRATION PLAN**

One administration per classroom:
Near end of spring semester
Start of the day (whenever possible)

15 minutes
(No more than 20)

Mobile Monitoring
Instructor needs to be available to help students

*Administer survey during at least one observation, but you can administer at all five observations if you wish!

** Only one survey administration per classroom (no student should take the survey twice).
SENDING SURVEY DATA TO THE PEAR INSTITUTE

• The PEAR Institute will assist you with data entry!

• DoS observers should use intra-district mail to send surveys to Tom Turner’s office
  – Be sure to include: name of observer (your name), classroom teacher name, date and time of survey

• The PEAR Institute will process/analyze data and provide back an individualized report back to OC STEM and participating classroom teachers
TIMELINE: MARCH TO MAY 2017

Start of STEM lessons

Classroom: DoS Observations

End of STEM lessons

Students: Common Instrument Suite Survey

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Data Report: Feedback for Orange County and Classrooms
Data Reporting: STEM Data Dashboard

City / Harvard STEM Innovation Hub
Name of Participating Organization/Program

The Common Instrument Suite (CIS) measures students' interest and engagement towards science, as well as other science-related attitudes (like science career interest and enjoyment) and 21st century skills (like relationships with peers and adults).

Methodology:
- Administered at 1 time point (end of program)
- Retrospective self-change survey: students rate whether they feel the same or different (more now, less now, about the same) about various statements as a result of their participation in the program

This Dashboard tool was designed by The PEAR Institute to help you better understand your program’s Common Instrument Suite results.
You can use the buttons above to navigate to different sections of this dashboard. The blue button indicates the current section you’re on. You can also use the tabs across the bottom of the workbook to navigate to different sections.

There is also a summary tab (see far right tab called “Summary”) that will provide you with a bigger picture of your findings. Note that you can press the “+” or “-” button at the lower right part each excel sheet to zoom in and out, respectively, if you want to take a closer look at your data.

If you have any questions about your data or would like further consultation, please contact our STEM Research Assistant, Elena Rossen, at egrossen@mclean.harvard.edu

The name of participating organization or program and funder of STEM hub have partnered with The PEAR Institute to measure the impact of XX out-of-school time (OST) programs on students’ STEM-related attitudes. Specifically, students enrolled in 10 XX programs, ranging from Grades 1 to 12 completed the PEAR Common Instrument Suite (CIS) survey between August 2015 - June 2016. The CIS survey asks questions.

Click here for video demo (2 minutes)
Data Reporting: Overview of Students

Race/Ethnicity:
- African-American, Blank: 6.8%
- American Indian, Native American, or Alaskan Native: 15.7%
- Asian, Asian-American: 27.6%
- Caribbean Islander: 21.8%
- Latino or Hispanic: 8.5%
- Middle Eastern or Arab: 1.7%
- Native Hawaiian or Other Pacific Islander: 0.2%
- White, Caucasian (non-Hispanic): 0.2%
- Other: 0.2%

Primary Language:
- English is Primary Language: 72.7%
- English is NOT Primary Language: 27.3%

Gender:
- % Female: 51%
- % Male: 49%

Previous STEM Exposure:

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree

Before joining this program, I was interested in science and science-related activities outside of school:
- Before joining this program, I participated in science-related activities outside of school:
Data Reporting: Comparing to National Data

<table>
<thead>
<tr>
<th>Category</th>
<th>Program</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much More</td>
<td>3.83</td>
<td>3.75</td>
</tr>
<tr>
<td>More</td>
<td>3.50</td>
<td>3.65</td>
</tr>
<tr>
<td>About the Same</td>
<td>3.44</td>
<td>3.65</td>
</tr>
<tr>
<td>Less</td>
<td>3.76</td>
<td>3.75</td>
</tr>
<tr>
<td>Much Less</td>
<td>3.91</td>
<td>3.91</td>
</tr>
</tbody>
</table>

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Areas that may benefit from more focused professional development include Organization, Space Utilization, and Participation.
Acknowledgments

Thank you! This evaluation is made possible with support from the Orange County Department of Education and the OC STEM Initiative. We are especially thankful to leaders in STEM education like yourselves!
Contact Us

Patty Allen, Ph.D.
pallen@mclean.harvard.edu

Ashima Mathur Shah, Ph.D
ashah@mclean.harvard.edu

Karene Thomas, M.S.
Kthomas@mclean.harvard.edu

Sean McCaffery, M.A.
Egrossen@mclean.harvard.edu

***For general information about using the CIS and DoS tools, please email Rebecca Browne, B.S. at: rkbrowne@mclean.harvard.edu