Key Findings from Project Scientist

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The Common Instrument Project

• The Common Instrument was developed with the support of the Noyce Foundation in 2010.

• Builds from research that identified STEM engagement and interest as important aspects of STEM learning and career pathways.

• Improves assessment capacity of STEM in after-school programs, summer camps, clubs, and other venues outside of school time.

• Provides the field with a valid, reliable and easy-to-use measure appropriate for use across a wide range of student populations.
Mechanisms through which program quality impacts outcomes

- **Student Science Interest/Engagement**
  - CI
  - **STEM Program Quality (DoS)**
  - **Social-emotional/21st century skills**
  - **HSA**
  - **STEM Outcomes**
The Common Instrument (CI): Measures students’ Science interest

- 4-point scale: Strongly Disagree (SD), Disagree (D), Agree (A) and Strongly Agree (SA)

- uni-dimensional: 10 items

- High internal validity; \( \alpha \) is typically \( \geq 0.90 \)

- Shows modest to high correlation with other science items/scales
  - National Assessment of education Progress (NAEP)
  - Test of Science Related Attitudes (TOSRA)
  - Program for International Science Assessment (PISA)
Younger Students (Ages 4-11)
The Common Instrument (CI) Pre/Post Test Survey 4-11

Today's Date: [ ] [ ] [ ]
Birthday: [ ] [ ] [ ]
First Name: [ ]
Last Name: [ ]

Science Interest: The Common Instrument

For each of the following statements, please circle the number that best describes what you think about the statement. Mark only one answer please!

1. Science is something I get excited about.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

2. I like to participate in science projects.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

3. I like to see how things are made (for example, ice-cream, a TV, an iPhone, energy, etc).
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree

4. I am curious to learn more about science, computers or technology.
   - Strongly Disagree
   - Disagree
   - Agree
   - Strongly Agree
Science Interest at the Beginning and End of the Program, Ages 4 to 11 (n = 166)
Program Participation and Becoming or Knowing a Woman Scientist, ages 4 to 11

<table>
<thead>
<tr>
<th></th>
<th>Beginning</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>See myself as a scientist</td>
<td>3.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Know or met a woman scientist</td>
<td>2.0</td>
<td>2.9</td>
</tr>
</tbody>
</table>

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
Older Students (Ages 12 and Above)
The Common Instrument (CI) Pre/Post Test Survey 12+

Today's Date: 

Birthday: 

First Name: 

Last Name: 

For each of the following statements, please answer how much you **DISAGREE** or **AGREE** with the following statements by circling the number that best describes what you think about the statement.

<table>
<thead>
<tr>
<th></th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
<td></td>
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<td>5.</td>
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<td>6.</td>
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<td>8.</td>
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<tr>
<td>9.</td>
<td></td>
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<tr>
<td>10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Science Interest at the Beginning and End of the Program, ages 12 and above, n = 18

- **Beginning**: Strongly Agree = 3.2, Agree = 3.3
- **End**: Strongly Agree = 3.2, Agree = 3.3
Program Participation and Science Career Interest and Knowledge, Ages 12 and Above, n = 18

<table>
<thead>
<tr>
<th></th>
<th>Beginning</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Interest</td>
<td>3.7</td>
<td>3.1</td>
</tr>
<tr>
<td>Career Knowledge</td>
<td>2.1</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Strongly Agree

Agree

Disagree

Strongly Disagree
What is the Holistic Student Assessment (HSA)?

• The HSA is a validated tool developed from years of research on resiliency and socio-emotional development.

• The HSA contains 14 subscales that assess students’ social and emotional development and life skills within three broad domains:
  • Resiliencies
  • Relationships
  • Learning/School Engagement.

• The HSA can be used as part of Early Warning data systems to identify students who show social, emotional, and developmental barriers to academic learning and life skills.

• It can also be used to evaluate program impacts.
The Holistic Student Assessment (HSA)
Retrospective Subscales

First Name: ___________________________  Last Name: ___________________________

Please circle the number that best describes what you think about the statement. Mark only one answer per line please!

<table>
<thead>
<tr>
<th>Thinking about how you feel today compared to the beginning of this program...</th>
<th>Much Less Now</th>
<th>About the Same</th>
<th>Much More Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>27. There are adults who are interested in what I have to say.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>28. I like to figure out how things work.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>29. When I try to accomplish something, I achieve it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>30. When I see another kid who is hurt or upset, I feel sorry for them.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>31. I think about the future of the world.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>32. Exercise is important to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>33. I think a lot about how I can make a difference in the world.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>34. I defend myself against unfair rules.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>35. I like being active.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>36. I feel bad for other kids who feel sad or have problems.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>37. I stand up for things that matter to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>38. I say what I think even if adults or friends disagree.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>39. I try to understand the world I live in.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>40. Other people's feelings matter to me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>41. I like being physically active and moving my body.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
Social-Emotional and 21st Century Skills
Ages 12 and Above, n = 18

Peers: 6.00
Adults: 5.40
Perseverance: 5.80
Critical Thinking: 5.70
Draw a Picture of a Scientist (DAST)

• Drawing Week 1 Day 1 @PS (male)

  Week 1 Day 1: 29.5% of drawings featured male scientists

• Drawing Week 1 Day 5 @PS (female)

  Week 1 Day 5: Only 12.5% featured male scientists
Summary of Key Findings

Ø Student interest in science was higher at the end of the program compared to the beginning for both age groups.

Ø Younger students (ages 4 to 11) were significantly more likely to see themselves as a scientist, and have met a woman scientist after program participation.

Ø Students in the 12+ group were significantly more likely to have higher amounts of science career interest and science career knowledge at the end of the program compared to the beginning.

Ø Overall, students reported positive changes in indicators of social-emotional/21st century skills.
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