STELAR ITEST PI & Evaluator Summit

Building the Foundational Skills of the Future Science and Engineering Workforce

Friday, June 16, 2017
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:45am</td>
<td>Keynote Panel</td>
<td>Ballroom ABC</td>
</tr>
<tr>
<td>10:00am</td>
<td>Strand Sessions 2</td>
<td>Breakout rooms</td>
</tr>
<tr>
<td>11:45am</td>
<td>Lunch</td>
<td>Breakout rooms</td>
</tr>
<tr>
<td>12:45pm</td>
<td>Thematic Meetups 2</td>
<td>Breakout rooms</td>
</tr>
<tr>
<td>2:15pm</td>
<td>Plenary: Strand Review</td>
<td>Ballroom ABC</td>
</tr>
<tr>
<td>2:45pm</td>
<td>NSF Town Hall and Closing Remarks</td>
<td>Ballroom ABC</td>
</tr>
<tr>
<td>3:30pm</td>
<td>Goodbye!</td>
<td></td>
</tr>
<tr>
<td>Strand 1. Sharing effective approaches and instrumentation for ITEST research and evaluation</td>
<td>Salons 1-2</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td>Strand 2. Fostering innovation through inclusion and diversity in STEM education and the workforce</td>
<td>Ballroom C</td>
<td></td>
</tr>
<tr>
<td>Strand 3. Work at the frontier: Preparing students for the future STEM workplace</td>
<td>Ballroom A</td>
<td></td>
</tr>
<tr>
<td>Strand 4. Big data: ITEST’s role in developing career pathways and data literacy</td>
<td>Ballroom B</td>
<td></td>
</tr>
<tr>
<td>Thematic Meetups</td>
<td>Location</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>Cultural competence in program development and implementation</td>
<td>Ballroom A</td>
<td></td>
</tr>
<tr>
<td>Implementing high-quality research designs</td>
<td>Ballroom B</td>
<td></td>
</tr>
<tr>
<td>Developing effective instructional and curricular models for educators</td>
<td>Ballroom C</td>
<td></td>
</tr>
<tr>
<td>Incorporating online teaching and learning with emerging technologies</td>
<td>Salon 1</td>
<td></td>
</tr>
<tr>
<td>Involving parents/families/caregivers in project implementation</td>
<td>Salon 2</td>
<td></td>
</tr>
<tr>
<td>Engaging principals, guidance counselors, and other administrators to promote STEM-learning experiences</td>
<td>Salon 3</td>
<td></td>
</tr>
</tbody>
</table>
Keynote Panel

*Career development theory: From theory to practice in ITEST projects*

David Blustein
Kimberly Scott
Eli Tucker-Raymond
Joyce Malyn-Smith
Strand Review

**Strand 1.** Sharing effective approaches and instrumentation for ITEST research and evaluation

**Strand 2.** Fostering innovation through inclusion and diversity in STEM education and the workforce

**Strand 3.** Work at the frontier: Preparing students for the future STEM workplace

**Strand 4.** Big data: ITEST’s role in developing career pathways and data literacy
Strand Review
Strand 1. Sharing effective approaches and instrumentation for ITEST research and evaluation

Strand highlights
• Great networking / problem-solving space
• Discussed importance of mixed methods
• Shared resources, traditional / non-traditional instruments

Challenges and/or opportunities
• Measuring STEM identity (still)
• Adapting instruments without jeopardizing validity
• Responsive instrumentation to changing landscape
Strand 1. Sharing effective approaches and instrumentation for ITEST research and evaluation

**Activity:** List-serv “ITEST-Oriented Measurement Community”

**Who will be involved:** STELAR moderated, community-driven

**By when:** Starting over the summer

**Expected outcome(s):** Shared space for communicating, sharing new research and instrumentation, finding collaborators, identifying gaps. Searchable and archiveable.
Strand 2. Fostering Innovation through inclusion and diversity in STEM education and the workforce

Strand highlights
- Common vision and similar design across INCLUDES and ITEST
- Bring together INCLUDES and ITEST communities
- Share successes, challenges and lessons learned on student engagement and teacher PD strategies that will broaden participation in STEM

Challenges and/or opportunities
- Tap into the history of ITEST’s successful collaborative strategies and their impact (mini-collective impact)
- Offer a workforce development ‘lens’ to INCLUDES
- How to address sustainability and dose effect
Strand 2. Fostering Innovation through inclusion and diversity in STEM education and the workforce

**What activity:** Possibly a workshop that brings the two program communities together to share insights around implementation challenges, populations served, context for the work and content.

**Who will be involved:** ITEST projects and INCLUDES pilots

**By when:** TBD

**With what resources:** STELAR coordination with projects, possibly a future INCLUDES conference proposal.

**Expected outcome(s):** A roadmap for how both of these program communities can connect and collaborate to have greater impact on BP in STEM.
Strand 3. Work at the frontier: Preparing students for the future STEM workplace

Strand highlights

• Learned how NSF is framing work at the human-tech frontier
• Concerned about how to make work at the frontier more inclusive
• Need for more resources/information about issues as the relate to the Human Tech Frontier

Challenges and/or opportunities

• Interventions about computational thinking are mostly limited to programming
• Socio-cultural supports needed to further technological based thinking
• Development of STEM career competencies/ literacies needs more collaboration with teacher prep programs
Strand 3. Work at the frontier: Preparing students for the future STEM workplace

Activity: Workshop/webinar on the HTF (what it is, what it means for STEM education) Create a repository of resources on the HTF for the ITEST Community

Who will be involved: Human Tech Frontier Working Group (Francis, David, Analise, Janet B., Alex, Andia, Dana, Dagen, Jidong, Kim Nicholas, Youwen, Sandro, Ami, Chadia, Javed, Kathryn)

By when: Start in 2 weeks (space created, at least one doc included, HTF working group)

Expected outcome(s): ITEST community will be better able to inform other communities about work at the HTF as it relates to K-12 education. Possible Measures: # hits and downloads to repository
Strand 4. Big data: ITEST’s role in developing career pathways and data literacy skills

Strand highlights
• What are big data? Are they different? Do we need different tools?
• People are enthusiastic
• Ethical and cultural considerations

Challenges and/or opportunities
• Lots of room for new projects that are using real really big data
• How do we create educational tools, learning progressions, approaches that help youth become data literate when we’re not quite sure what the goals are
• Still need to define parameters and frameworks as well as core competencies

This material is based upon work supported by the National Science Foundation under Grant No. DRL 1614697. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
Strand 4. Big data: ITEST’s role in developing career pathways and data literacy skills

What activity: Understanding data literacy standards, frameworks, educational approaches, and connections to other domains
Who will be involved: Anyone who wants to be
By when: Next year
With what resources: Would be a great tool for the STELAR website!
Expected outcome(s): Curating and consolidating existing resources into online handbook, toolkit, or open space for current and future PIs
NSF Town Hall

Sarita Pillai, Principal Investigator, STELAR

David Haury, Program Director, Division of Research on Learning, NSF

Evan K. Heit, Division Director, Division of Research on Learning, NSF
ITEST PI Summit Closing Remarks

Evan Heit
Division Director, Division of Research on Learning Education and Human Resources Directorate
National Science Foundation
Division of Research on Learning (DRL)

• Vision: DRL’s research and development portfolio advances the best STEM learning for all.

• Mission: DRL cultivates and catalyzes fundamental and applied R&D to improve the learning of Science, Technology, Engineering, and Mathematics for the Nation.
NSF’s 10 Big Ideas for Future Investment

**Research Ideas**
- Navigating the New Arctic
- Harnessing Data for 21st Century Science and Engineering
- Work at the Human-Technology Frontier: Shaping the Future
- Understanding the Rules of Life: Predicting Phenotype
- The Quantum Leap: Leading the Next Quantum Revolution
- Windows on the Universe: The Era of Multi-messenger Astrophysics

**Process Ideas**
- Growing Convergent Research at NSF
- NSF INCLUDES: Enhancing Science and Engineering through Diversity
- Mid-scale Research Infrastructure
- NSF 2050: Seeding Innovation
National Science Board Presentation on the Skilled Technical Workforce, 2017

• NSB member Dr Victor McCrary, Vice President for Research and Economic Development at Morgan State University.
Blue Collar STEM: The Big Picture

- STEM plays an important role in a nation’s technological innovation & economic growth*

- Two STEM economies: workers with 4-year & graduate degrees (‘white collar’) AND workers with high school, vocational training, or 2-year degrees (‘blue collar’)**

- Estimated 6M to 26M US STEM-based jobs total**

- For workers with less than a 4-year degree:
  - 6M STEM jobs using narrow definition
  - 13M STEM jobs using a skills-based definition
  - Context: 1M STEM workers with a PhD

* Rising Above the Gathering Storm, National Academies
Thank you!!!

Evan Heit
National Science Foundation
STELAR ITEST PI & Evaluator Summit

Building the Foundational Skills of the Future Science and Engineering Workforce

Friday, June 16, 2017