

STELAR ITEST PI & Evaluator Summit

*Building the Foundational Skills of the Future Science
and Engineering Workforce*

Friday, June 16, 2017



Friday Agenda

8:45am	Keynote Panel	Ballroom ABC
10:00am	Strand Sessions 2	Breakout rooms
11:45am	Lunch	Breakout rooms
12:45pm	Thematic Meetups 2	Breakout rooms
2:15pm	Plenary: Strand Review	Ballroom ABC
2:45pm	NSF Town Hall and Closing Remarks	Ballroom ABC
3:30pm	Goodbye!	



Strands

Strand 1. Sharing effective approaches and instrumentation for ITEST research and evaluation	Salons 1-2
Strand 2. Fostering innovation through inclusion and diversity in STEM education and the workforce	Ballroom C
Strand 3. Work at the frontier: Preparing students for the future STEM workplace	Ballroom A
Strand 4. Big data: ITEST's role in developing career pathways and data literacy	Ballroom B



Thematic Meetups

Cultural competence in program development and implementation	Ballroom A
Implementing high-quality research designs	Ballroom B
Developing effective instructional and curricular models for educators	Ballroom C
Incorporating online teaching and learning with emerging technologies	Salon 1
Involving parents/families/caregivers in project implementation	Salon 2
Engaging principals, guidance counselors, and other administrators to promote STEM-learning experiences	Salon 3

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



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 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 they 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



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

The infographic is set against a light blue background with a grey stone-patterned base. It features ten distinct cards, each with a unique image and text. The top section, 'RESEARCH IDEAS', contains six cards. The bottom section, 'PROCESS IDEAS', contains four cards. The cards are arranged in a grid-like fashion, with some overlapping slightly.

RESEARCH IDEAS

- Navigating the New Arctic**: Image of icebergs.
- Harnessing the Data Revolution**: Text includes 'ANALYTICS', 'DATA SCIENCE', 'FUNDAMENTAL RESEARCH', and 'MACHINE'. Image shows a person at a computer.
- Work at the Human-Technology Frontier: Shaping the Future**: Image of a futuristic city with flying cars and screens.
- Understanding the Rules of Life: Predicting Phenotype**: Image of a small green plant growing from soil.
- The Quantum Leap: Leading the Next Quantum Revolution**: Image of a quantum circuit or particle interaction.
- Windows on the Universe: The Era of Multi-messenger Astrophysics**: Image of a satellite and a telescope.

PROCESS IDEAS

- Growing Convergent Research at NSF**: Image of colorful bokeh light spots.
- NSF-INCLUDES: Enhancing Science and Engineering through Diversity**: Image of a diverse group of people.
- Mid-scale Research Infrastructure**: Image of a large steel truss bridge over water.
- NSF 2050: Seeding Innovation**: Image of a blue network of lines with the text 'NSF 2050' and 'ADVANCING ENGINEERING AND SCIENCE'.

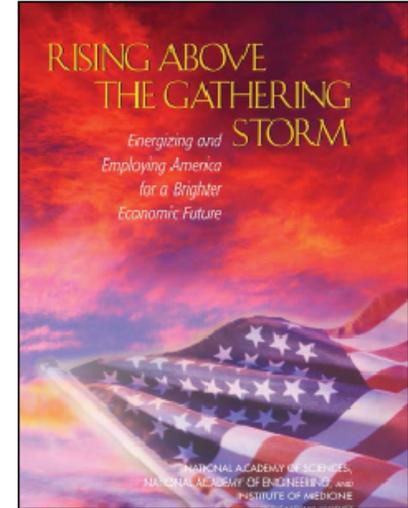
National Science Board Presentation on the Skilled Technical Workforce, 2017

- 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

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