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STEM LEARNING AND RESEARCH CENTER

Work at the Human-Technology Frontier Webinar One: Future Work

Thursday, January 25, 2018

Hosted by: **Sarita Pillai, Joyce Malyn-Smith, and Caroline Parker**
STEM Learning & Research Center (STELAR)
Education Development Center, Inc.

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Series of 4 Webinars: Work at the Human-Technology Frontier

Future Work at the Human-Technology Frontier

Thursday, January 25, 2018 2:00 – 3:00 pm ET
Joyce Malyn-Smith, Sarita Pillai, Caroline E. Parker (STELAR Center)

The Psychology of Working

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Who We Are:

- STEM Learning & Research Center (STELAR)
- Resource Center for the Innovative Technology Experiences for Students and Teachers (ITEST) Program
- Located at Education Development Center in Waltham, MA
- Supporting the ITEST program and its grantees since 2003
- Available to assist those considering submitting an ITEST proposal

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NSF's ITEST Program

- Since 2003, NSF has invested $382 million in more than 344 ITEST projects
- As of 2016, the ITEST program has reached
  - 566,500 youth
  - 16,900 educators
  - 6,800 parents & caregivers

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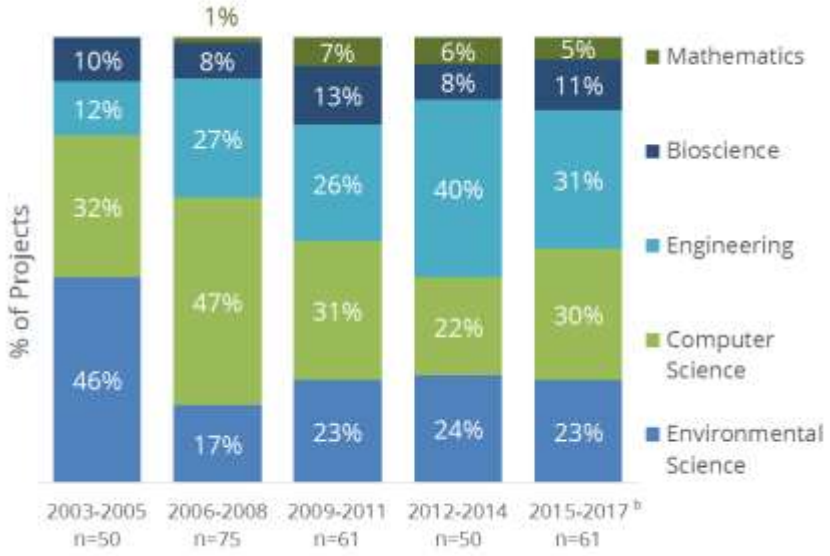
ITEST youth and educators learn to use cutting-edge technologies across multiple STEM disciplines, engaging in career exploration



ITEST youth and educators learn to use **cutting-edge technologies**

- Visualization/computer modeling
- Multi-media authoring
- Game development
- Simulations & virtual reality
- Geospatial technologies
- Imaging technologies
- Wearable technologies
- Energy monitoring devices
- Mobile air quality detection systems

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What We Do

- Facilitate projects' success through **technical support** with a focus on synthesis of findings
- Inform and influence the field of STEM stakeholders by **disseminating** project findings nationally
- Deepen the impact and reach of the ITEST program by **broadening participation** in the ITEST portfolio

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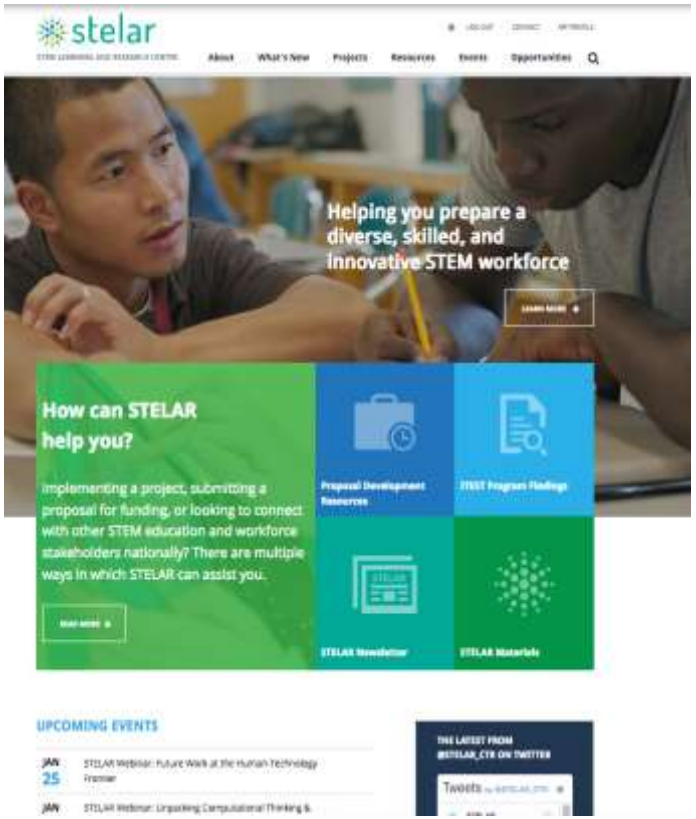

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The Human-Technology Frontier

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How Industry Leaders View Future Work

- Predominance of dynamic, interdisciplinary teams
- Focus on data
- Artificial intelligence
- Ubiquitous computational thinking
- Engineering design/design thinking
- Convergence and focus on life sciences

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How Industry Leaders View Future Work

- Cybersecurity and working within insecure systems/ boundaries
- Blurred boundaries between humans and machines
- Education/training emphasis on problem-based learning and solving real world problems
- Increased focus on continuous, life-long learning
- Ethics at the human-technology frontier

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New Type of Worker

STEM Competent

- Deep knowledge of science, technology and engineering
- Technical skills
- Keep data safe, interpret and tell data stories
- Computational thinking – use, modify, create technologies
- Comfortable partnering with machines

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New Type of Worker

Abilities

- Willing to think outside the box, be innovative and disruptive
- Solve problems and risk failure
- Self-directed, curious, resilient
- Cooperative and interpersonally competent
- Lead dynamic interdisciplinary teams to consensus
- Characterized by insight, diligence, persistence and cooperation

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Equity, Access and Ethical Implications in Work at the Human-Technology Frontier

- Existing underrepresentation of certain populations in the STEM workforce
- Growing inequity hastened by the advent of AI, machine learning, robotics
- Massive shift in requisite skills to enter labor market
- Diversity is a primary driver for innovation
- Transforming the world of work

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Equity, Access and Ethical Implications in Work at the Human-Technology Frontier

- Existential risk from advanced AI and other technologies
- Technologies are not a mere 'artifact'
- "Optimistic visions of the future"
  - Robust systems immune to hacks
  - Preservation of resources and purpose
  - Values aligned with the H-T frontier
  - Legal and ethical status of AI
- Public policy in the new era of machine-human collaboration

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Who is the Workforce of the Future?

- Populations traditionally underrepresented in STEM are the very groups who will be the workforce of the future:
- Culturally and linguistically diverse learners
- 9.4% of students in US are English learners
- 13% of students in US are identified with disabilities
- 50% of students in US identify as race/ethnicity other than white
- One third of students in US attend rural schools
- Half of students in US are girls

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Barriers to STEM faced by learners

In schools

- Access to grade level rigorous content courses
- Bias in discipline
- Pressure on teachers to teach to the test
- De facto segregation
- Deficit mindset

"Everything connects" outside of schools too

- Me too movement
- Black lives matter
- Immigration

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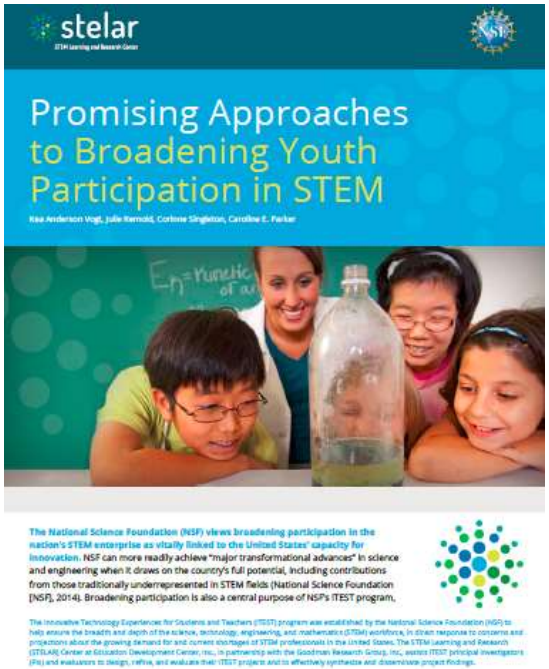
Pushing the conversation

How can we create spaces where culturally and linguistically diverse learners transform future possible workplaces?



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Q and A

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