2019 STEM Leadership Alliance Summit

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STEM4: The Power of Collaboration for Change

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Engaging All students through Active Learning in a Design-Driven Integrative STEM Education Classroom!

- Integrative STEM Education (I-STEM Education)
- Why ALL students?
- What Does I-STEM Education Look Like?
- A Call To Action!
Integrative STEM Education

WHY I-STEM EDUCATION?
WHY NOW?
**Integrative STEM Education** is operationally defined as:

"the application of technological/engineering design based pedagogical approaches to intentionally teach content and practices of science and mathematics education through the content and practices of technology/engineering education. Integrative STEM Education is equally applicable at the natural intersections of learning within the continuum of content areas, educational environments, and academic levels." (Wells & Ernst, 2012/2015)

(as adapted from Wells/Sanders VA Tech program documents 2006-10).
What “STEM” Looks Like

- **Ted Talk Video of Jane Chen’s Project!**
- “A Warm Embrace That Saves Lives!”

**IDEO and Shark Tank**
I-STEM Education = STEM Literacy

- Connects Learning
- Engages ALL students
- Motivating
- Authentic/Contextual
- Increases rigor
STEM⁴: The power of collaboration for change

A joint document authored by Advance CTE, Association of State Supervisors of Mathematics, Council of State Science Supervisors, and International Technology and Engineering Educators Association
Cooperatition! = Gracious Professionalism

The power of collaboration for change
The Major Issues

» Lack of STEM preparedness

» Many STEM careers have not yet been envisioned

» Lack of Equity
Three Main Principles

Principle 1.

STEM education should advance the learning of each individual STEM discipline.
Three Main Principles

Principle 2.

STEM education should provide logical and authentic connections between and across the individual STEM disciplines.
Three Main Principles

Principle 3.

STEM education should serve as a bridge to STEM careers.
Why does this matter?

» Student engagement

» Relevance

» Funding opportunities
Recommended Actions

» Ensure high-quality STEM learning

» Increase access and equity for students

» Provide professional learning opportunities for teachers.
ITEEA Reach Challenge!

Brainstorming STEM PROJECTS for next school year?

✓ MUST: Bring STEM skills to life in a real-world, meaningful way.
✓ MUST: Inspire students to innovate ways to help their community.
✓ MUST: Include pre-made lesson plans, activities, worksheets + slides.
✓ BONUS: Earns your school grant opportunities and awards.

Found it!
Welcome to the REACH Challenge Toolkit! This toolkit provides educators and team leads with everything they need to complete this design-thinking project. Each section includes ready-made lesson plans, slide presentations, worksheets, hands-on activities and inspiring explorations aligned with Next Generation Science Standards (NGSS). The toolkit is designed to bring technology and engineering to life for high school and college students, giving them the opportunity to use their STEM skills to help overcome human challenges for social good, making a real-world difference in the lives of those around them.
Submission Guidelines
Students will learn the details of the REACH Challenge, including a sample submission. This section provides teams with tips on finding a User-Expert, product discounts, templates, and tips on technical writing, photography, and videography.

Assistive Technology
Students will explore the world of adaptive technology, as well as why these technologies are critically important for those with ability challenges. The exploration will include case studies, resources, and an inspiring lesson on the power of inclusiveness.

User-Centered Design
Students will create a piece of adaptive technology as they develop a high-level of understanding of User-Centered Design, where the engineer includes its end user throughout the design process, which is filled with iteration. This section includes a fun lesson on the importance of failure.

Empathy + Safety
Students will learn how empathy and safety methods are applied to each step in the User-Centered Design process. This section includes an activity on listening, and how to conduct a good user interview to obtain qualitative and quantitative data.

Engineering Prototypes
Students will build a working prototype of their idea, applying what they’ve learned about User-Centered Design. Tips, tricks and resources for prototyping will be taught through hands-on activities as well as explorations and slides on common mechanisms and control systems.

Intellectual Property
Students will take on the role of an entrepreneur as they learn how to present their innovation to the world. This section includes information about open source options and the patent process, as well as tips on protecting intellectual property.
Be a part of ITEEA’s STEM Showcase
Baltimore, MD     March 11-14, 2020

Preview of 2019 STEM Showcase
https://tinyurl.com/yxpbmaj
We hope to see you and ALL your colleagues at ITEEA’s 82nd Annual Conference in Baltimore, MD
March 11-14, 2020

Students Who Study Technology and Engineering
“Bring STEM to Life!”
Website RESOURCE LINKS!
http://www.ITEEA.ORG

Request Preview Access to EbD courses

Or Google “EbD BUZZ Resources” and scroll down to Request for EbD™ Course Review Access

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ITEEA Reach Challenge for your students!

ITEEA STEM School of Excellence Program!
“After mutual respect and understanding are achieved, it is possible to establish real, sincere relationships, which is the foundation of a solid long-term collaboration.” - Ron Garan, NASA Astronaut
Be an active Participant! Bring STEM to Life!

The bottom line is we are here to support you and your colleagues!

Be ACTIVE PARTICIPANTS! :- )

Be ACTIVE LEADERS! :-)