



Smithsonian
Science Education Center

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International K-12 Science Education Institute for Leadership Development and Strategic Planning

What was it?

- A 5 day institute that challenged participants to work together to construct a vision of inquiry based, hands-on STEM education that supports a scientifically literate, career-ready citizenry.
- District teams were introduced to integral components of change related to improving STEM education by addressing the 5 elements of the Leadership and Assistance for Science Education Reform (LASER) systemic reform model.



The Branchburg School District Community ... exists to inspire our students to be innovative thinkers and well rounded contributors to society.

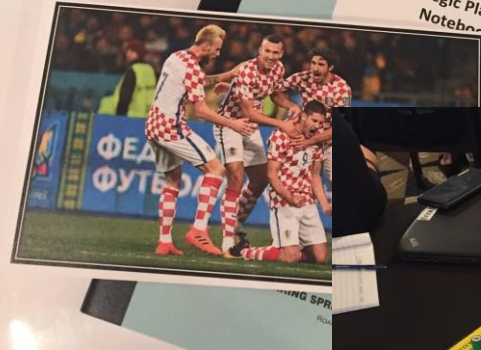
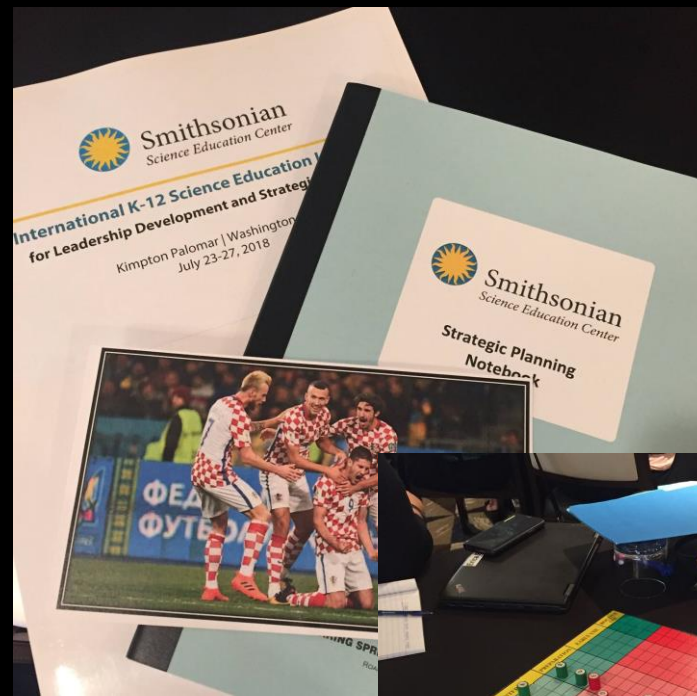
... Existe para inspirar a nuestras estudiantes a ser pensadores innovadores y contribuyentes completos a la sociedad.

@SmithsonianSci
#laserspi

bit.ly/2018spi

NETWORK: Kimpton
Open Google Chrome
Click "connect"

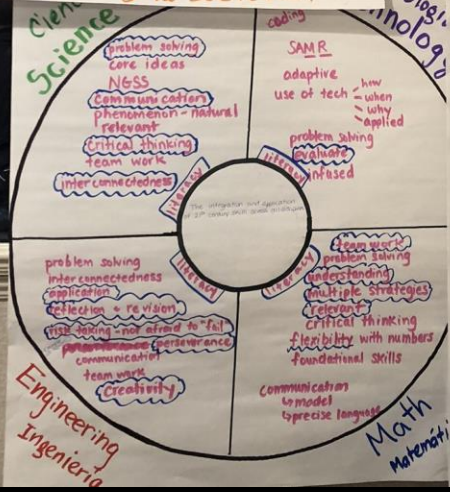
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Team Branchburg #BravoB

We expect students to:

- Make observations + ask questions
- Figure out how to test their ideas
- Gather and analyze data
- Work collaboratively
- Communicate effectively
- Draw conclusions
- Reflect + evaluate
- Persevere - Growth mindset
- Take risks
- Be innovators
- Apply their learning

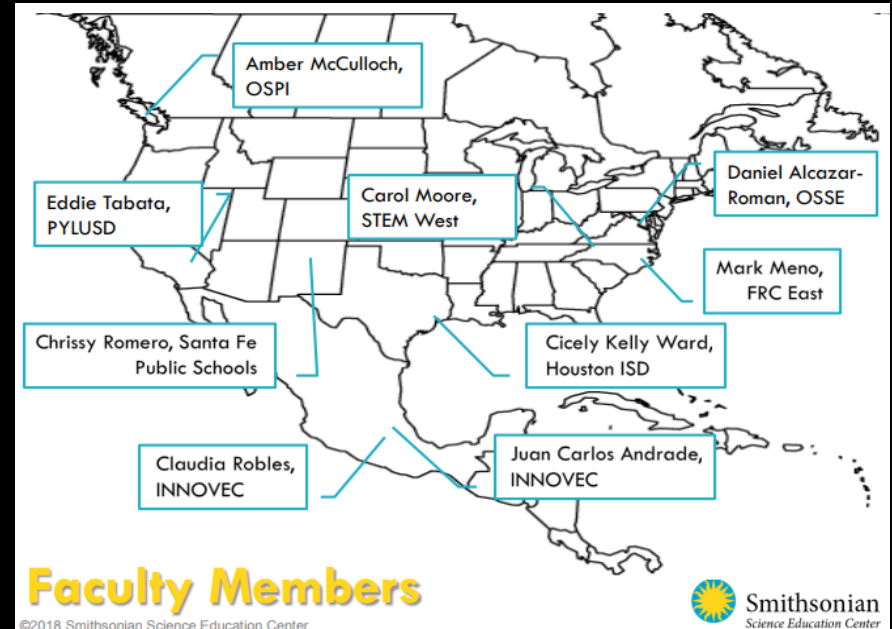


Discussion topics included:

- the changing landscape of STEM education
- systematic change in the school system
- a shared vision of effective learning & teaching
- effective curricular material examination
- professional development: for teachers, engaging the community and the role of administration
- workforce preparedness for STEM sectors
- developing & sustaining administrative and community support
- evaluation & assessment

Who was there?

- 10 school districts from across the United States and 3 from Mexico
- Representatives from STEM sectors across the country



Bilingual Experience

- International Faculty and Teams



What did we do??

Estado de México

Que los estudiantes:

- Sean analíticos, creativos e innovadores, reflexivos y empáticos
- Logren aplicar los conocimientos para la resolución de problemas de la vida cotidiana, a través del enfoque STEM (con valores)
- Logren integrarse socialmente
-

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VERACRUZ

- Identificación y resolución de problemas y fenómenos
- Que sean críticos y persistentes
- Que trabajen en equipo y sean colaborativos
- Curiosidad para indagar
- Apropiación del conocimiento y ser usuario del mismo
- Desarrollar habilidades de lenguaje y comunicación

We identified common goals for our students ...



We designed solutions
to real world problems ...

We Networked ...




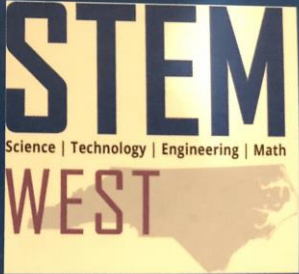
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What is the primary objective of education?

Prepare students for productive citizenry, including gainful employment.

What does that entail – from the perspective of a teacher?



Credit: Getty Images

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We looked at our curriculum and discussed how we are preparing our students ...

The STEM workplace needs employees who are:

- **Educated** and trained
- Technically proficient
- **Communicative**
- **Collaborative**
- Self-confident
- **Independent**
- Reliable
- Accountable
- Flexible
- Respectful of diversity

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We identified the importance of educating our students to be effective communicators who can collaborate ...

We reiterated that it is critical to produce innovators who can problem-solve, be creative and persevere ...

The STEM workplace needs innovators who are:

- Creative
- Curious
- Passionate
- Analytical
- Fearless of failure
- Evidence-based decision makers
- Objective and open-minded

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We visited Workforce sites ...

BUS

- George Washington University
- New District Brewing

Metro

- National Zoological Park
- Smithsonian American Art Museum





THE GEORGE WASHINGTON UNIVERSITY

Robot-Assisted Socio-Emotional Intervention Framework for Children with Autism Spectrum Disorder

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ONCEHST
NICHD

Autism Spectrum Disorder and Robots

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by impairments in social interaction and communication. According to the Centers for Disease Control and Prevention, every 2 in 68 children in the US is now diagnosed with ASD. In this study, we proposed a series of interventions designed to target multiple areas of impairment in ASD, including emotion regulation, sensory processing, as well as emotional understanding and expression.

Our Framework

Machine operation → Social interaction → Facial expression analysis → Problem resolution → Social interaction → Robot operation → Emotion recognition → Emotion expression → Emotion regulation

Emotional Interaction and Regulation Game

Socio-emotional Sensory Activity

A sensory activity involving multiple sensory stations, each providing a unique sensory stimulus that the child and robot experience together, aimed at improving tolerance to sensory stimuli, is

Gesture Identification Game

The robot acts out 12 different emotions, including sad, scared, excited, disgusted, curious, proud, angry, shy, surprised, pleased, frustrated and tired.

Results

Percentage of time spent with robot
Number of correct responses per game

Discussion

Spending time with the robot
Following the robot's instructions
Giving it directions: moving it in & out of social entry

References

Acknowledgements



NEW DISTRICT BREWING CO



STEM skills and concepts are used daily at SAAM!

Conservationists gave us a behind the scenes look ...



We even had some
time for sightseeing ...

We left with a plan to:

- create a network of possible contacts within the surrounding community as well as those from the Institute
- hold department meetings with staff to gather ideas for additional cross curricular connections
- meet with administration to share content at grade level bands and help them recognize where they are connected



I HAVE THE AUDACITY TO BELIEVE THAT PEOPLES EVERYWHERE CAN
HAVE THREE MEALS A DAY FOR THEIR BODIES, EDUCATION AND
CULTURE FOR THEIR MINDS, AND DIGNITY, EQUALITY,
AND FREEDOM FOR THEIR SPIRITS.

