STEM Education

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Elected Member - Nevada State Board of Education – CD4

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Member - Northwest Career and Technical Academy – Academy of Engineering Advisory Board

Member - UNLV College of Engineering Industry Advisory Board

Chair - UNLV Department of Computer Science Industry Advisory Board

33 Years of Professional STEM Industry Experience

STEM Importance

- Last summer, the President of the United States made improving STEM education a national priority
  - "*Our effort to improve STEM Education is going to make more of a difference in determining how well we do as a country than just about anything else that we do here.*"
- Last year Governor Sandoval released his "Moving Nevada Forward" plan to diversify our economy into new economic sectors
  - These are STEM sectors
  - Governor's plan spotlights STEM Education
  - Indirectly makes STEM Education a state priority
- Viewed as critical for our future economy and defense

Jobs for the 21st Century

- Many jobs in STEM fields currently go unfilled
- STEM jobs are expected to grow faster than non-STEM jobs
- More jobs require STEM knowledge
    - The most common undergraduate degree among S&P 500 CEO's is Engineering.
- Possibly 50% of current STEM workforce nearing retirement
- We import STEM workers
    - As a nation and as a state
- We want these 21st Century jobs for our children

Some Key Points

- Goal – Inspire students in the STEM subjects and increase the number of students capable of entering STEM professions (STEM Pipeline)
- STEM workforce requires strong Math and Science
  - Math and Science are most failed subjects on the HSPE
  - Math is a major source of college remediation
  - Level of K12 Math (Algebra II) predicts college success
- STEM Education is not just high school career training
- K12 gender and racial gaps become STEM workforce chasms
  - Men outnumber women 3 to 1
  - Whites out number Latinos and African Americans 12 to 1
- Can compliment with current education priorities

STEM Pipeline Failure Point

- Students inadvertently self select out of STEM fields in early middle school largely based on their perception of Math and Science
  - These perceptions are most commonly developed in elementary school
  - Limited exposure to STEM careers and professionals
  - Math and Science not perceived as relevant
  - Particularly problematic for girls, children of color, and children in poverty
  - They avoid and minimize High School Math and Science
    - Sometimes insufficient to graduate
    - Insufficient to enter STEM programs without remediation
- Early K12 STEM education can have a significant impact on the size and makeup of our STEM workforce

What Seems to Work

- STEM advocates promote of a set of techniques that have been shown to inspire students in STEM subjects
    - Incorporates Project Based Learning
    - Incorporates inquiry, experimentation, creativity, collaboration, innovation and is interdisciplinary
    - Exposes students to STEM careers and professionals
    - Adds STEM based extracurricular activities
    - Needs rigorous curriculum
    - Needs teachers with deep rich content knowledge
    - Develops problem solving and critical reasoning skills
    - Makes Math and Science relevant
- Nevada has pockets of excellence in STEM Education
    - We need to scale STEM Education statewide

State Board – Near Term

- SB 345 (Advisory Council on STEM)
    - In response to strategic moves by other states
    - Interdepartmental membership
    - Reports to State Board of Education
        - National and statewide best practices
        - Strategic STEM Plan
    - Places State Board in a STEM leadership position
- Next Generation Science Standard (NGSS)
    - Inquiry based
    - Reinforces both Common Core Math and ELA
    - Opportunity to use NGSS roll out to take STEM to Scale