

National Indian Country STEM Effort and Workforce Development Initiative Meeting

Date/Time: July 7, 2016 1:30 – 4:00pm

Location: National Indian Programs Training Center 1011 Indian School Rd., NW, Ste. 254
Albuquerque, NM 87104

Meeting objectives: The meeting and discussion focused on the creation of a National Indian Country STEM Effort and Workforce Development Initiative

Attendance: see list below

Meeting Summary: Office of Indian Energy Director Mr. Chris Deschene and the Office of Indian Energy seek to find the answers to several questions including: What would a National Indian Country STEM Effort and Workforce Development Initiative look like and who would lead that effort? What can be done to advance this idea into a large scale effort and bring it to the forefront with Tribal communities and potential stakeholders? Is it possible to create something that is sustainable and long term?

Agenda:

- Welcome & Outline of Meeting Objectives
- Brief Introductions
- Background and Presentations: the current state of STEM in K-12 for American Indian and Alaska Native Communities (AI/AN)
- Discussion: What are the opportunities for STEM in Indian Country? Who has the resources? What are the challenges to deployment or mobilizing opportunities?
- Break-out groups for action planning: what actions can we take to coordinate and mobilize actions and/or address the challenges to deliver STEM to AI/AN young people?
- Next steps: small teams, champions, team coordination
- Adjourn

Welcome & Outline of Meeting Objectives *(Chris Deschene, Director Office of Indian Energy Policy and Programs)*

Director Chris Deschene welcomed participants and spoke about DOE Office of Indian Energy Policy and Programs goal of maximizing the development and deployment of energy solutions for the benefit of American Indian and Alaska Natives. These include:

- ✓ Promoting tribal energy development
- ✓ Reducing or stabilizing energy costs for tribes
- ✓ Strengthening Indian country energy and economic infrastructure
- ✓ Bringing electric power to Indian lands

Foundational to this work is supporting workforce development in energy industries in Indian Country. This is key to advancing Indian energy policy. There is tremendous resource potential on tribal lands that could support an estimated 5 percent of total US renewable energy potential. DOE Office of Indian Energy has invested \$52 million in 148 tribal energy projects over the last few years. The goal is to increase staff at the Office of Indian Energy and grow staff from eight employees to twenty-five.

He also spoke about the Office of Indian Energy's many accomplishments during FY 15:

- ✓ Released Strategic Roadmap 2025 in March 2016
- ✓ Issued the Arctic Integration Plan
- ✓ Many issues addressed including the energy water nexus, micro-grids, etc.
- ✓ The office is helping create a path to economic sovereignty through communications, partnerships, the institutionalization of effort, advancing Indian energy policies, and maximizing services to Indian Country.

Focus in 2016 will be on deployment, innovation and policy. He concluded that leadership and resources are key to making progress and that he was committed on both accounts.

Previous Listening Session & Science of Sport Briefing (Karen Atkinson, Acting Deputy Director, DOE Office of Minority Business and Economic Development)

Acting Director Karen Atkinson reviewed information gathered in the previous year's listening sessions and from the morning session on the Science of Sport initiative.

Background and Presentations: Current state of STEM in K-12 for AI/AN Communities (*Sandra Begay, Sandia National Laboratories/ AISES Executive Director Emeritus*)

To provide food for thought Sandra Begay spoke about current statistics of AI/AN in STEM fields.

- ✓ AI/AN students have the lowest graduation rates of any minority group¹
- ✓ Only 47 percent of AI/AN students attended public high schools where the full range of mathematics and science courses were offered²
- ✓ Only 7 of 100 will earn a Bachelor's degree³
- ✓ AI/AN are underrepresented in STEM fields, especially women (only 1 out of 13,000 AI/AN women are in the US Engineering workforce)⁴

¹ U.S. Department of Education, Senate Committee on Indian Affairs (2014) "Indian Education Series: Examining Higher Education for American Indian Students."

² National Center for Education Statistics, Table 219.80. (2011)

³ National Caucus of Native American State Legislators (2008) "Striving to Achieve: Helping Native American Students Succeed."

⁴ National Action Council on Minorities in Engineering (NACME). (2012). "American Indians in Engineering." Vol. 2, No. 2, Pg. 1.

Sandra also shared how STEM concepts can be introduced to kindergarteners by using the three little pigs example. The common fable incorporates concepts of engineering such as building material strength and lateral loads.

Discussion: What are the opportunities for STEM in Indian Country? Who has the resources? What are the challenges to deployment or mobilizing opportunities? (*Participants worked in small groups*)

Working group members discussed where the opportunities for STEM are, who has the resources, what challenges exist to deploying STEM curriculum, and what resources for mobilizing opportunities are available for different age groups. The age groups were as follows: little one (Pre K – 2nd grade), elementary school, middle school, high school, and post high school.

Elementary School: Pre K – 5th grade

✓ Opportunities for STEM

- Early childhood teacher preparation programs - AA
- Pueblo day schools
- Elementary schools
- USDA extension program – family education
- Youth council
- Engineering in elementary (EIE)
- Scratch program (free web-based computer science program)
- Informal science education (museums, etc.)
- PBS learn/SciGirls
- Lego mindstorms, RoboRave and other robotics programs
- University STEM outreach programs
- School visits/programs by practicing STEM professionals
- Hands-on science/STEM kits (mindcraft)
- Junior achievement
- PLTW launch
- Mc² (NMSU train teachers)
- NGSS
- Science fairs
- “Near Peer” mentors (undergrad mentors)
- Field trips
- Parent/community involvement
- Natural environment (hands-on)
- Pets
- Gardening/cooking
- Invention convention

- Destination imagination
- Summer camps
- Clubs
- Music, art, and dance programs
- Sports and food (nutrition)
- Integration or cultural themes and connections (river exchange project)
- Environmental monitoring
- Early childhood development preparation
- ✓ Who Has the Resources?
 - Head Start PD money
 - BIE PACE programs
 - U.S. Department of Education
 - Bureau of Indian Education
 - PED
 - USDA
 - NIH
 - AISES
 - Department of Energy
 - NASA
 - White House early STEM initiative
 - National Labs
 - Universities and colleges
 - School districts
 - Private industry
 - NSF
 - Tribal industries
 - Scholarships for teachers
 - Native technical mentors/translate
 - NM PED – making sense of science (P.D. program for elementary teachers)
 - Expanding your horizons
 - Traditional storytelling
 - Afterschool programs
 - NM out of school time network
 - Invention convention
 - Teachers teaching teachers
- ✓ Challenges to deploying resources or mobilizing opportunities
 - Changing mindset – STEM education at an early age is possible
 - Local policies
 - Teacher PD in math and science
 - Resource prioritization
 - Federal red tape
 - Language
 - Broadband access
 - Need to leverage mobile platforms – beyond gaming for entertainment

- Well-qualified teachers
- Not teaching science K – 3rd grade
- PreK – 5th grade teachers lack science and math content knowledge
- Attention span
- Self-confidence
- Tracking information and ROI
- Gender equity
- Engagement
- Developing observation opportunities
- Cultural competencies and professional development for existing teachers
- Geographic challenges
- Emphasis put on testing rather than learning
- High competition and waitlists for Pre-K programs
- Poverty and family issues impact learning

Middle School: 6th - 9th grade

✓ Opportunities for STEM

- NM MESA program
- PLTW gateway
- National Lab programs
- AISES virtual science fair and robotics
- Mentorship opportunities with high school and/or college students
- Española youth center robotics
- Youth centers
- Afterschool programs
- Gardening programs – community gardens, environment, nutrition
- AAUW tech trek for incoming 8th grade girls
- Cultural program integration with science – indigenous knowledge and science
- Faith-based groups
- Wellness programs
- Adobe building and entrepreneurship program – NACA
- Kahn academy
- University-based STEM outreach programs
- STEM competition programs
- GUTS competition, science fair, Olympiad, robotics, etc.
- Informal science education programs/groups (4H, boy scouts, girl scouts)
- NMSU – NM prep academy, VEX, Best robotics, FFA
- STEM application – physically, mentally
- Career exploration
- Accelerated learning for math to catch-up
- STEAM

✓ Who Has the Resources?

- Government agencies
- Private entities
- In-kind support
- Technical resources
- Natural/geographic resources
- SNL DCSP
- Universities/colleges
- STEM information education providers (museums, etc.)
- National labs
- Non-profits
- Professional societies
- State/city agencies
- College prep
- Trio
- 4H/FFA

✓ Challenges to deploying resources or mobilizing opportunities

- Need for equitable partnerships
- Collaboration, communication, and coordination
- Implications of working on similar projects
- Competing for limited resources
- Data quality and collection
- Small communities need a voice and face unique challenges
- Active participation of tribal leadership
- Resistance to change
- Repository of information (look at NM STEM IT connection)
- SNL DCSP has a limited number of instructors
- How to determine if a resource is of high quality
- Counselor/academic advisor's knowledge or high school and college requirements
- Middle school as a transition – “growing pains”
- Gender equity
- Location
- Transportation
- Networking
- Collaboration between BIE, state, tribal, and charter schools
- Mindset or tribal leaders
- Internet access
- Lack of mentors

High School: 10th - 12th grades

✓ Opportunities for STEM

- Extracurricular clubs for Native American students (UNM HSC, DreamMakers Club)
- Native American summer academy – provides leadership opportunities
- Dual credit (high school and college credit) programs – Bridge, project Lead the Way
- Camps that focus on Math
- AISES STEM competitions
- Recruitment
- DOE lab/headquarters internships
- Science fairs
- Science of Sport
- College Horizons and college prep
- Sandia Labs – family science and math nights
- Robotics clubs/competitions
- STEAM camps
- Mentorships (SNL, LANL)
- Honors society
- Volunteer opportunities
- NM MESA
- SACNAS
- Internships
- Kirtland AFRL and ARL
- Prep academy NMSU
- TANF and WIB
- Math and Science academy
- Pre-SAT and SAT for free
- Career pathways
- AP/IB programs
- Online opportunities
- National conferences – high school students
- Enrichment programs (K – 12 Sunday Academy)
- Kumon
- Community-based education
- Kahn academy

✓ Who Has the Resources?

- NM state workforce solution funded programs
- Federally funded programs – BIE/DOE/BIA/Labs
- Tribal leadership support
- Private corporations
- WB3
- Tribal libraries
- American Indian Graduate Center (AIGC) scholarships
- AISES

- Parents
- Boys and Girls club
- Rotary clubs
- Universities and colleges, including tribal SIPI and community colleges
- WIA – funds can now be used for STEM fields
- National Indian Youth Leadership council
- UNITY – leadership development program for youth
- Academic advisors
- National Labs
- NMSU - STEM school, project Lead the Way, and robotics program
- RoboRave
- Title 2A funds
- College \$ plan
- Social media
- Carl Perkins Vocational education
- NASA
- NSF
- SIPI experiential learning opportunities
- Department of Energy
- Department of Education
- ✓ Challenges to deploying resources or mobilizing opportunities
 - Commitment to disseminate information
 - Student over commitment
 - 23 different tribes in NM
 - Need to be more intentional, active, and focused
 - Accessing resources
 - Funding streams and their restrictions
 - Knowledge of opportunities
 - Continue science education at home, teach parents
 - Lack of life skills/workforce development skills
 - Geographic implications
 - Getting enough students interested
 - Technology limits
 - Staffing, especially in rural areas
 - Limited academic support and advisement
 - Competing for the same resources
 - Parent support
 - Transportation money or funds
 - Scaling
 - Flexibility or finances and personnel
 - Funding territories – federal vs. state
 - Continuity and sustainability
 - High school counselor training for SAT/ACT funding – Indian education resource teachers

- Lack of communication
- Top-down support to schools
- The number of teachers licensed to teach STEM
- Preparation of high school teachers to teach STEM
- Family obligations
- Meeting GPA standards

Break-out Groups for Action Planning: What actions can we take to coordinate and mobilize actions and/or address the challenges to deliver STEM to AI/AN young people? (*Participants worked in small groups*)

Working group members developed a group consensus on some broad-based actions that could be taken to mobilize actions and deliver STEM to AI/AN young people.

- ✓ STEM projects
 - Create a STEM summer camp
 - Pick a project that currently exists and integrate Science of Sport curriculum
 - Get teacher and student input
 - Partner with existing STEM programs
 - Implement Science of Sport in DCSP in 2016
 - Develop subgroups and teams
- ✓ Share success stories
 - Inform the community – what is science?
 - Take advantage of social media and social networking
 - Share the success stories of others
- ✓ Mentoring
 - Reach out to rural areas
 - Recreate the mentorship program
 - Expand NM MESA as a broader reaching initiative
 - Mentorship from community member who went to college and finished

Participants were then asked to complete an individual brainstorming session and ponder the discussion questions. Each member then shared their ideas in small groups to generate data. Each team submitted data for each discussion question.

Actions to coordinate and mobilize

- ✓ Resources
 - People
 - Agencies/organizations
 - Highly effective teachers with content knowledge
 - Academic and experiential learning opportunities
- ✓ Networking and Partnerships
 - Pooling resources
 - Collaboration between entities

- Communication
- Capacity building
- ✓ Coordination
 - Strategic doing (agile planning)
 - Community engagement
 - Building dialogues
 - Family buy-in
 - Sense of belonging
 - Access
 - Coordinate STEM programs that target K-12
 - Identify all of the current programs
 - Identify the funders
 - Reverse the “silo” nature, but allow for programs to operate independently if they prefer
 - Identify and develop tools for collaboration
- ✓ Staffing
 - Recruitment of highly-skilled staff
 - Offer continuing education
 - Colleges need to emphasize the skills
- ✓ Funding
 - Form partnerships for funding
 - Regional grant applications
 - Affordability
- ✓ Just “Do it” (Strategic Planning)
 - Identify a core team with defined responsibilities
 - Develop/negotiate vision, outcomes, and benchmarks
 - Develop a holistic strategic plan

Challenges to delivering STEM to AI/AN young people

- ✓ Cultural Considerations
 - Need to understand the culture to fully understand the challenges
 - Address the cultural aspects that may conflict with STEM strategy
 - Traditional obligations can be a challenge to implementing STEM curriculum
- ✓ Communication
 - Lack of communication between leadership and educational institutions
 - Leaking pipeline – share statistics on the impact of not completing education
 - Start/continue the conversation on the business imperative for STEM education in Indian Country – including: tribal leaders, industry partners, government entities, and Native American students
- ✓ Community Engagement
 - Ease the culture shock transition between BIE schools and public schools
 - Parent engagement
 - Engage in dialogue with community on why to continue education

- Inform the community on the importance of STEM curriculum in Pre-K to 12th grade
- Need greater community involvement and input
- Need for relevant and relatable engagement
- ✓ Leadership
 - Need leadership to define priorities, establish targeted goals, and make a commitment to STEM education
 - Foster leadership qualities in our students
 - Lack of support/buy-in from leadership
 - Leadership capacities
 - Policies should be established
 - Need leadership support – presidential, tribal mandate
- ✓ Other Challenges
 - Changing STEM stereotypes
 - Transportation
 - Limited internet access – there is a tech deficit
 - Need to address lack of STEM teachers
 - Funding needs to be identified to increase the number of teachers and facilitate professional development
 - Increase STEM experience
 - Competing demands on time (family, cultural, etc.)
 - One size doesn't fit all

NEXT STEPS

- A leadership team was formed for participants interested in taking a more proactive role. If you would like to join the leadership team, please contact Sandra Begay at skbegay@sandia.gov
- Feedback from participants is welcomed to help clarify any concepts or to add details to ideas.

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