LANL FOUNDATION
Investing in Learning & Human Potential

STEM INNOVATION NETWORK FOR NEW MEXICO PARTNER CONVENING

SUMMARY REPORT

November 7, 2024

A HYBRID MEETING

Hotel Albuquerque, Albuquerque, NM

Zoom

Convened by

The Encantado Foundation, the LANL Foundation, and the STEM Innovation Action Team including representatives from the Encantado Foundation, LANL Foundation, MSAC, NM MESA, NM Out-of-School Time Network, NMSU STEM Outreach Center, Society of Women Engineers, STEM Boomerang, Triad LLC/Los Alamos National Laboratory Community Partnerships Office, and UNM Project ECHO

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This report was completed by Kersti Tyson, Ph.D., Wanda Bulger-Tamez, Zach Taylor. We thank the convening participants for their rich contributions. Members of the STEM Innovation Action Team reviewed the first draft of this report and provided valuable feedback that was incorporated into the final version of this report.

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Introduction

What is a STEM Innovation Network?

The purpose of a STEM Innovation Network is to coordinate, facilitate, and spur Science, Technology, Engineering and Mathematics (STEM) Education Innovation for 21st century workforce and economic development throughout New Mexico.

Living in the 21st century calls for a 21st century education. As New Mexicans navigate the realities of living in a local/global society that will continue to evolve throughout the 21st century, our state must prepare its youngest citizens and future workers to thrive by providing a sufficient education. At the heart of a 21st century education is ensuring all children and youth have access to a vibrant STEM education, an education that equips students with the critical thinking, creativity and problem-solving skills and identities called for in the fields of Science, Technology, Engineering and Mathematics – practices that, more and more, are embedded in every 21st century career and in our ways of life. The ever-evolving nature of 21st century technologies, knowledge, practices, and skills mean that education must evolve as well.

21st century challenges call for 21st century solutions. A networked approach to STEM education transformation is needed to prepare the workforce and citizens NM needs in the coming years. A 21st century STEM workforce is vital for economic development now, and in the future. Preparing the workforce of the future will require ongoing and systemic cross-sector collaboration and coordination between public education – from early childhood education through college – Tribes, workforce and economic development, industries, and communities.

- A STEM Innovation Network for New Mexico (STEM IN NM) composed of a steering committee, principal hub, and regional hubs can spur this coordination, drawing from local, regional, and state assets while being responsive to local needs.
- STEM IN NM will help to ensure that STEM education and career pathways align with the STEM professions, industry, and community needs throughout New Mexico.
- The STEM Innovation Network for NM is designed to ensure every PreK-12 student has the in-school and out-of-school (OST) opportunities they need to develop the skills, knowledge, practices, and identities required for participating and thriving in 21st century workforce and society..
- NM needs a systematic, coordinated effort across sectors to ensure that every student in NM has access to:
    - STEM inquiry learning in school every day. Our students need access to 21st Century learning opportunities that are throughout their school day, particularly in mathematics, science and other STEM learning opportunities.
    - Regular access to Out-of-school STEM programs. Our students need regular access to the after school programs, STEM competitions and other experiences that foster students' interests and identities in STEM.
    - STEM career pathways exploration in middle school and high school. Our students need access to the mentorships, internships, field trips and other experiences that help them to explore STEM careers and know of the excellent STEM careers that exist in New Mexico.

Components of a STEM Innovation Network include:

STEM IN NM Steering Committee: The STEM Innovation Network is governed by a STEM IN NM Steering Committee composed of representatives from community, Tribes, industry, higher education, PreK-12 education, Out-of-school time providers, and government. The Steering Committee will meet at least quarterly to set the goals, vision, and strategic direction for STEM IN NM.

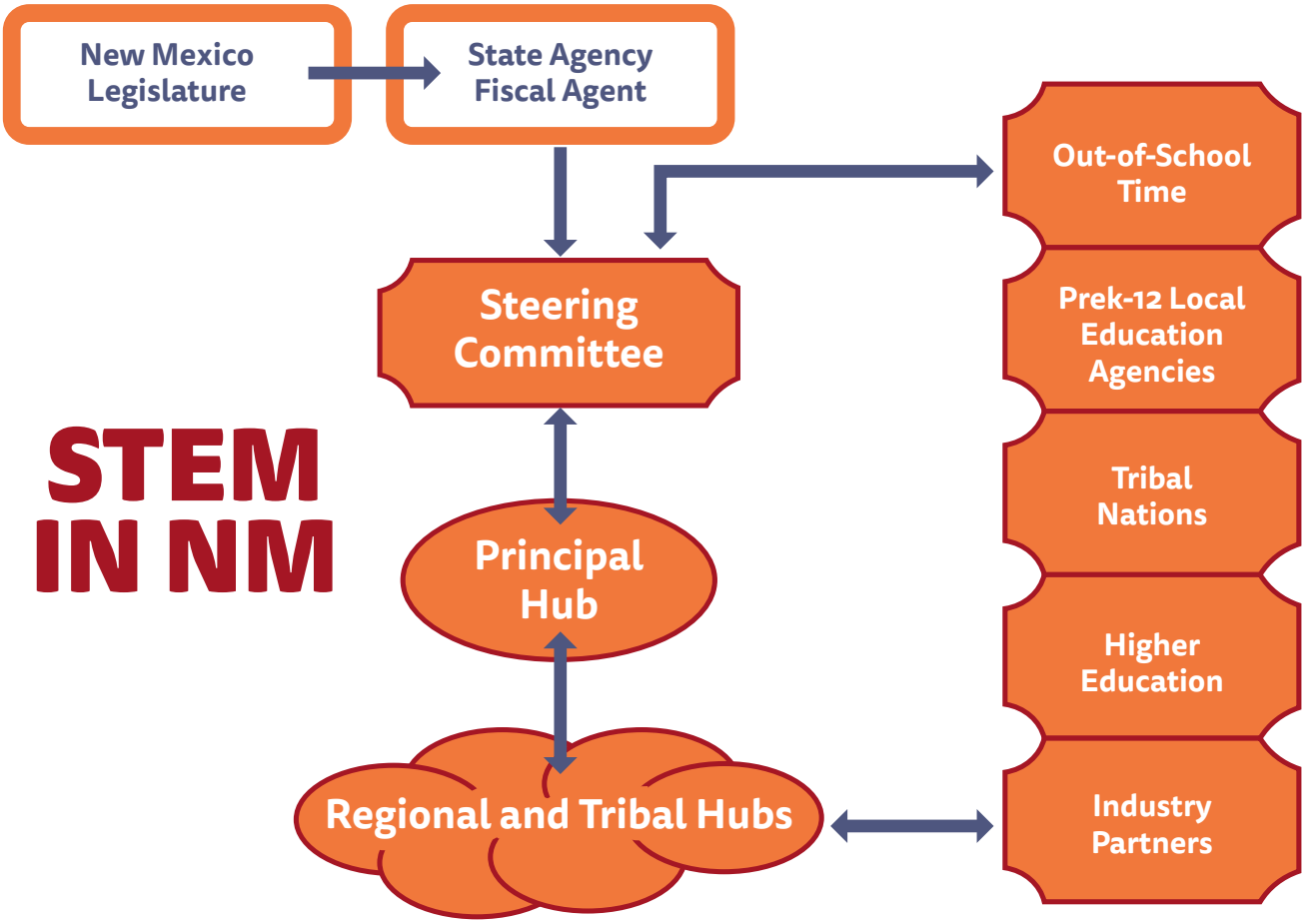
STEM IN NM Principal Hub: The STEM Innovation Network will hire a team to monitor, direct, and coordinate STEM efforts throughout the state as the STEM IN NM Principal Hub. This team will lead the development of a STEM Innovation Framework for schools, OST programs, and classrooms; coordinate STEM professional learning for teachers and administrators; create a database and maps of all STEM-related programs throughout the state; identify and support regional and Tribal STEM hubs; coordinate with industry to identify career pathways and employment trajectories; work with Higher Education's STEM programs and faculty to integrate STEM research into NM's youth's opportunities to learn STEM; help youth learn about the STEM education programs and career opportunities in our state; and coordinate with communities throughout the state to support STEM internships, mentorships, and other opportunities.

STEM School Designation: The STEM Innovation Network could work with the Public Education Department's (PED) Math and Science Bureau and the Math and Science Steering Committee to create a STEM Innovation Framework and designation process to support schools, out-of-school time (OST) programs, and classrooms to offer 21st century STEM learning opportunities that are culturally and linguistically sustaining. The STEM Innovation designation would be a volunteer process and schools, OST programs, and teachers could opt in to participate. It will include an iterative self-study and review process. The designation would last for five years, after which schools, OST programs, and teachers will have to renew their designation to spur ongoing innovation in the STEM education opportunities our children and youth will require for 21st century thriving and workforce development.

STEM IN NM Regional & Tribal Hubs: Each regional and Tribal hub will have a director who will conduct a needs assessment, with support from the STEM IN NM Principal Hub, in terms of students' access to everyday STEM inquiry learning in school, access to out-of-school time STEM programs, and middle and high school students' access to STEM career pathways, including Work-Based Learning (WBL), Career and Technical Education (CTE), internships, mentorships, and engagement with industry in the region. Annually, each regional and Tribal hub will submit a proposal to the STEM IN NM Steering Committee that delineates the needs in their region, their focus for the year, and their budget. The Steering Committee and Principal Hub will monitor and provide support to the STEM IN NM Regional and Tribal hubs. Tribes, with respect to Tribal sovereignty, will have the option to join a regional hub or to create their own Tribal hub(s).

Each regional or Tribal hub will support and grow signature programs in their area based on what has worked in the past, what school districts, industry, community, Tribes, and higher education need. There are many examples of innovative programming throughout the state that can be leveraged and connected to systematically expand STEM learning opportunities for all of NM's children and youth. Regional and Tribal hubs could include higher education institutions, Regional Education Cooperatives (RECs), districts and charter schools (LEAs), STEM nonprofit organizations, industry, and community partners. For example in northern NM, the Northern NM STEAM Coalition might become a regional hub and could focus on supporting nonprofit organizations to grow out-of-school time STEM programming, as well as support STEM teacher leaders in the region through programs like the Los Alamos National Laboratory (LANL) Math and Science Academy's Math

Teacher Leader Network or the Teacher Leader Fellowship led by the LANL Foundation. In the south, the NMSU STEM Outreach Center, which already serves as a regional hub for STEM education in southern New Mexico could become a regional hub. The STEM Outreach Center serves close to 5000 students by offering out-of-school time STEM programs in accessible ways. NMSU's MC2 also has a long history of providing professional development to support teachers to deepen and improve their math instruction. In central NM, Explora might consider being a regional hub, leveraging the activities and partnerships of X Studio, Explora's STEM-focused teen center in Albuquerque. In addition, Explora's outreach initiatives and NM Mathematics, Engineering, Science, Achievement (MESA) programs could work with hubs across the state to expand their reach. Through the regional and Tribal hub model, the STEM Innovation Network will help to support, coordinate, and disseminate the models that work in New Mexico, to ensure that every student in NM has access to the in-school and out-of-school time STEM education needed, for thriving in the 21st century.



Creating a STEM Innovation Network for New Mexico

Building on NM's assets for a local/global 21st century education: Our histories, cultures, and languages are an integral part of the 21st century education that will ensure NM students thrive. We are committed to learning from the educational approaches delivered over the past centuries and truly strive to center students and locally ground education in 21st century principles and practices. We recognize that 21st century thriving means recognizing and honoring local ways of knowing and uplifting cultures and languages that are the heart and soul of New Mexico's diverse communities and families. Embracing the local/global balance is vital for 21st century thriving because the innovations our society calls for will be borne from diverse ways of knowing and being. Embracing the local/global balance is vital for 21st century thriving because the innovations our society calls for will be borne from diverse ways of knowing and being. Attending to the needs and interests of our children and youth is the way forward for New Mexicans to thrive in the 21st century and beyond, honoring what has been in the background and bringing it to the foreground, as is named in the Martinez/Yazzie lawsuit. While not every student will become a STEM professional, every student will be able to make the choice based on their interests and passions. By ensuring every student has a rich and rigorous STEM foundation grounded in learning opportunities that are culturally and linguistically relevant, they will be prepared to thrive as citizens in a technological future. As a state rich in culture, language, and diversity, STEM fields in NM will benefit from ensuring that our youth have STEM foundations grounded in local knowledge as these foundations are essential to contribute to the innovations and solutions called for in the 21st century.

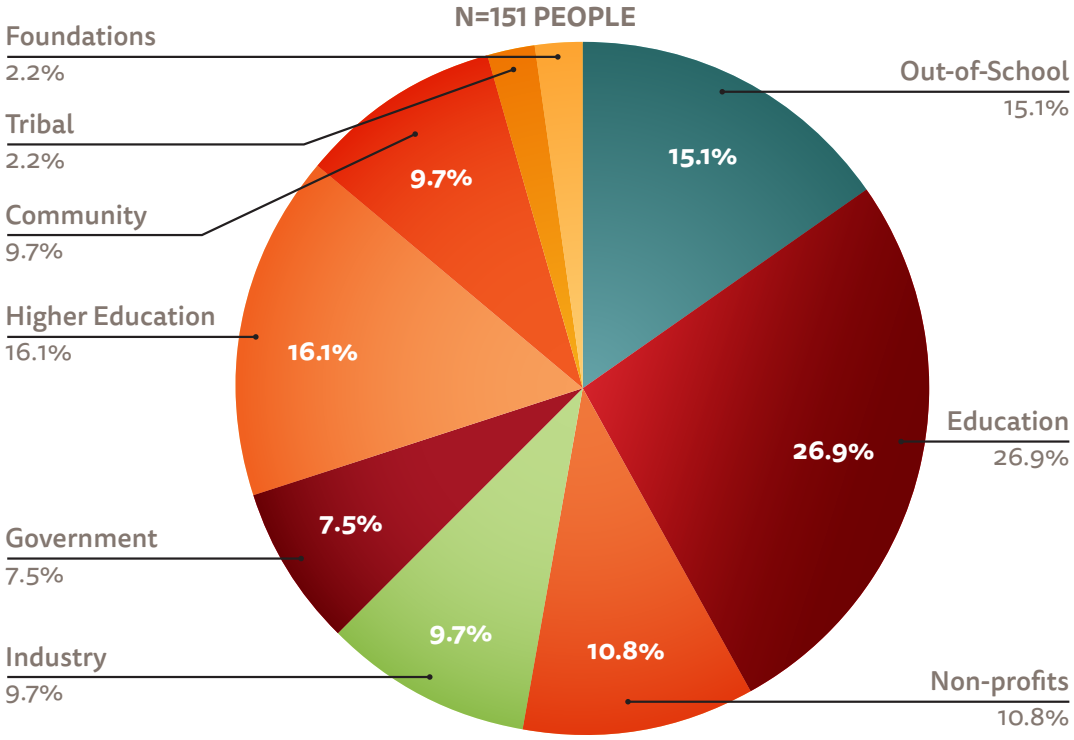
Convening Report

Overview:

On November 7th, 2024, Kersti Tyson, PhD, LANL Foundation and Monica Martinez Archuleta, PhD, Triad/LANL, co-chairs for the Northern NM STEAM Coalition and the STEM Innovation Action Team (a collective of STEM education advocates in New Mexico), in partnership with the Encantado Foundation, hosted a statewide day-long convening of stakeholders to discuss the creation of a STEM Innovation Network for New Mexico (STEM IN NM). Representatives from multiple sectors of the community were present in person and virtually including educators from K-12 schools, out-of-school time organizations, and higher education institutions; state government representatives; business and industry representatives; nonprofit leaders; Tribal community representatives; and community advocates. Zach Taylor from the Center for Transforming Education facilitated the convening with the support of the STEM Innovation Action Team. Heather Summers from Project ECHO expertly facilitated the virtual space, ensuring those participating on Zoom were fully included throughout the day.

The STEM IN NM Convening was divided into two parts. Despite a sudden snow storm in the region, over 100 people attended the morning session in person and virtually to learn about past and current efforts to create a STEM Innovation Network in New Mexico, to hear panels of experts speak about the need for STEM education innovation in NM from employers and workforce development perspectives, and to learn from leaders of STEM Innovation Networks in other states. In the afternoon, a smaller group of about 50 participants engaged in discussions to envision the work they would like to see a STEM Innovation Network accomplish in NM.

Creating a STEM Innovation Network Convening Registration Representation by Entity



Keynote: Dr. Gwen Perea Warniment, President and CEO of the LANL Foundation

The Convening began with a keynote presentation from Dr. Gwen Perea Warniment, President and CEO of the LANL Foundation, to set the foundation for the day's work and discussions. She has been supporting the development of a STEM Innovation Network in NM for over a decade as a science program leader at the LANL Foundation, as Assistant Secretary of Education at the Public Education Department, and as Director of the Legislative Education Study Committee. Given this breadth and depth of experience and perspective, Dr. Perea Warniment, in her new role as President and CEO of the LANL Foundation, provided context, history, and vision for a STEM Innovation Network in her keynote address to the convening. Dr. Perea Warniment highlighted that a networked approach to innovation in STEM Education in NM builds on steady work by STEM advocates in our state. That advocacy stretches from the 30-plus year-history of the NM Partnership for Math and Science Education (NMPMSE) who advocated to create the Math and Science Advisory Council and the Science and Math Bureau in the Public Education Department to the recent creation of SERI – the STEM+Education Research Institute at NMSU. She emphasized the importance of developing an entity in New Mexico that could bring key partners from across sectors together to innovate STEM education as we look toward the 22nd century. She emphasized that:

> *"A STEM Innovation Network that can connect the dots for all of us in this space is pretty fundamental for two reasons. The 1st is to be able to identify, connect, and strengthen our existing STEM programs and partnerships. Second is that it will allow us to measure the success of STEM programs and grow those that work well, as regions collaborate across sectors in order to meet the needs and interests of their communities. It enables us, essentially, to function as a large sort of macro level learning organization. And measure. It allows us to ensure that programs are accessible to every New Mexican, as a fundamental given that we are a pretty rural state, and equip New Mexico students with the knowledge and skills to thrive in a technologically- or science-driven future and ensure that we have the STEM workforce to grow our economy and participate as a savvy citizenry."*
>
> - **Dr. Gwen Pererea Warniment**, *President & CEO*, LANL Foundation

PANEL I: Standing on the Shoulders of Giants: What STEM Networks are Accomplishing in Other States:

The first panel included leaders from successful STEM Networks in other states, who joined the convening virtually from Louisiana, Michigan, and Ohio. They shared perspectives on the development of networked approaches to STEM education and STEM Innovation Networks, lessons learned, and successes from across the nation. The panel included:

- **Dr. Clint Coleman**, *Program Administrator, LASTEM, Louisiana Board of Regents*
- **Megan Schauban**, *Executive Director, MiSTEM, Michigan Department of Labor and Economic Opportunity*
- **Heather Sherman**, *Director, STEMx™ Network, Battelle Education*

STEM Network panelists shared their experiences about their own state networks, as well as the national network for STEM Networks, STEMx™. Each panelist described how STEM Networks have formed and are run in their respective state, highlighting how each entity has similarities and differences in how they were first developed, how they are structured, how they are funded, and how they provide support for STEM education innovation across their states.

STEMx and the Ohio STEM Learning Network: Representing Battelle, Heather Sherman from STEMx, and former Director of the Ohio STEM Learning Network, described how the Ohio STEM Learning Network (OSLN) has a public-private partner agreement between Battelle Foundation and the Ohio State Department of Education. OSLN is a "client of the Department of Education". Goals are developed for the year, and funding is provided to Battelle to support the operation of the OSLN. In addition, Battelle invests their own funding as part of their commitment to fostering STEM education innovation in Ohio. As the OSLN website describes:

The OSLN is committed to helping the State of Ohio inspire and train the next generation of innovative leaders. They leverage existing STEM schools and programs to spread effective practices and tools across the state and the nation. The Ohio STEM Learning Network:

- Connects innovative schools, teachers, and administrators to one another and to national resources
- Supports schools and communities that want to create innovative schools and programs
- Builds community awareness and drives school and industry partnerships

OSLN has seven regional hubs and is governed by a "Community of Practice." In addition, OSLN supports the Ohio STEM and STEAM school designation process. Schools select to participate in a designation process guided by the Ohio STEM Committee. School designations are given by the Ohio Department of Education and advised by the Ohio STEM Learning Network. OSLN reached over 60,000 students throughout Ohio in 2023. (https://osln.org/who-we-are/about-osln/)

Battelle also manages the Tennessee STEM Innovation Network, which was modeled after the Ohio STEM Learning Network, and STEMx, a national network that convenes over twenty other state STEM Networks. STEMx brings STEM education leaders together to "advance high-quality STEM education as a workforce and equity imperative." The Northern NM STEAM Coalition participates in STEMx. Battelle is a managing partner in Triad National Securities, LLC, with Texas A&M University and University of California. Triad manages Los

Alamos National Laboratory (LANL). Battelle's headquarters are in Ohio, and they partner with other entities to manage nine national laboratories throughout the United States, including Oak Ridge National Laboratory in Tennessee.

Louisiana's STEM Advisory Council, LASTEM: Dr. Clint Coleman, Program Administrator for Louisiana's STEM Advisory Council (LASTEM), described how LASTEM was formed by state statute in 2017 sponsored by state Senator Sharon Hewitt. The goal was to connect STEM education to workforce opportunities to circumvent the "brain drain" effect of students leaving the state after high school or not returning after college. ACT 392 created the Louisiana Science, Technology, Engineering, and Mathematics (LASTEM) Advisory Council. As described on their website, "Under the leadership of the Louisiana Board of Regents, the LASTEM Advisory Council:

- Created the Science, Technology, Engineering, and Mathematics Education Fund,
- Provides for a science, technology, engineering, and mathematics high school diploma endorsement, and
- Formed the Louisiana STEM Advisory Council. The council has 29 members, composed of cross-sector partners with an interest in STEM education."

Under Dr. Coleman's leadership, LASTEM created the Louisiana Regional STEM Center Network, a network of nine regional hubs.

> A system of STEM leadership entities strategically positioned across Louisiana, similar to the Regional Labor Market Areas (RLMAs) identified by the Louisiana Workforce Commission, whereby communities, parishes, multi-parish regions, and the State can achieve improved access to STEM education, participation, and advancement. This includes closing the opportunity gap for underrepresented and underserved populations to engage in Louisiana's STEM workforce and economy. Existing and developing STEM activities will often span one or more STEM Regions. Regions will share information, work together, and be interconnected by coordinating resources, which also provides a gateway to other networks and initiatives. The Regional STEM Networks and Centers are connected with and serve the statewide LASTEM Advisory Council.
>
> *(https://www.laregents.edu/lastem/)*

Initially, LASTEM followed the work that was developed through the Iowa Governor's STEM Advisory Council, Iowa STEM, and adapted it to reflect Louisiana's STEM landscape. (Iowa STEM was created in 2011.) In its 2024 Annual Report, LASTEM reported on the following accomplishments: "LASTEM has successfully coordinated and overseen the creation, delivery, and promotion of STEM education programs, increasing students' of all ages interest and achievement in STEM fields, and increasing alignment with Louisiana's economic development, industry, and workforce needs."

MiSTEM Network: Michigan's STEM Network, MiSTEM, is housed in the Michigan Department of Labor and Economic Opportunity. Megan Schauban, Executive Director, MiSTEM Network, shared that MiSTEM began under Governor Whitmer with legislation that was passed in 2017 from which the MiSTEM Network Plan was created.

> MiSTEM convenes a statewide network of leaders in education, business and local communities to empower the next generation of innovators. The Network works together to prepare learners for the

vital, high-demand careers of the future. As an office of the Michigan Department of Labor and Economic Opportunity, the MiSTEM Network and MiSTEM Advisory Council work together at the state and local levels to advance PK-12 STEM education, broaden access to STEM experiences and catalyze 3P learning beyond the physical classroom.

(https://www.michigan.gov/leo/boards-comms-councils/mistem)

Priorities of the MiSTEM Network are aligned with the governor's priorities for workforce and economic development. MiSTEM aims to advance "3P learning, which encompasses problem-, project- and place-based learning," throughout Michigan. A governing board made up of educators, business, and philanthropy make annual recommendations that are implemented by 16 regional hubs. MiSTEM works under a shared leadership model.

In their 2024 Annual Report MiSTEM reported the following accomplishments:

- Cross-sector partnerships continue to grow, with a notable 38% increase in partnerships with nonprofits in 2023-24.
- Authentic and relevant 3P experiences continue to increase year over year.
- About 44,100 students, 1,400 educators, and 3,900 others participated in grant-supported activities aligned with the Michigan Department of Education Career Development Model (MI CDM). MI CDM is designed to provide all Michigan students (K-12) with the necessary knowledge and skills for success in a career of their choice and lifelong learning. The 3P Statewide STEM Strategy supports the creation of guided career pathways for STEM careers that align with Michigan industry needs.
- Grant fund pursuit increased by 161% while Advisory Council-leveraged funding increased by 127%.; a combination of awarded grants (from the Advisory Council and Network Regions) and external funds — totaled $1,067,178.

(https://www.michigan.gov/leo/-/media/Project/Websites/leo/Documents/MISTEM/Reports/2024-MiSTEM-Annual-Report.pdf?rev=7db78aaf40844f6f8916f3bcbd7541a1&hash=56A81227D9EBA7902E0A21B7F9F10FA7)

State STEM Networks commonalities: STEM Networks in other states have the objective to ensure all students in their state have ready access to STEM education in-school and in out-of-school time. STEM Networks have been developed to drive equitable access to STEM education, and are economic and workforce drivers. Most STEM Networks have three things in common: a steering committee with cross-sector representation, a principal hub, and regional hubs. The size of the steering committees, the location (housing organization) of the STEM Network, and the number of regional hubs varies state to state. While there are many similarities, each STEM Network is unique and organized in ways that make sense for their state and its regional needs to ensure equitable access to STEM learning opportunities. STEM Networks help their state to develop a cohesive vision for STEM education and innovation aligned to workforce and economic development. They work collaboratively across sectors to expand access to STEM learning opportunities in-school and out-of-school and to STEM career pathways development. They also develop common metrics across initiatives and programs to monitor and spur the dissemination of effective STEM education. The work accomplished through STEM Networks in Ohio, Louisiana, Michigan, and other states provides examples for what a STEM Innovation Network in NM could aspire to do. By building on the lessons learned from other state's STEM Networks, collaborating with national partners through STEMx, and building on current and previous efforts in NM, New Mexico has the opportunity to adapt and innovate to develop and implement the models that will work for New Mexico.

PANEL II: Building Tomorrow's Workforce through the STEM Innovation Network. Expanding the STEM Talent Pipeline for Economic Growth and Industry Innovation

The second panel was composed of local industry professionals and state officials who have an interest and experience in cultivating talented young people from the community in STEM-related professions. They emphasized that STEM education innovation is vital for economic and workforce development in NM. The panelists from industry talked about what is needed in the job market, emphasizing the need for more STEM graduates who are from NM, and identified ways that a STEM Innovation Network could help fill that need by connecting youth to STEM careers throughout their PreK-20 education.

Monica Sandoval-Johnson, Co-Founder/CEO of STEM Boomerang, an initiative to bridge the gap between the STEM workforce and New Mexico employers, organized the panel and moderated the discussion among the five panelists who helped to bring focus to the importance of innovative STEM education for NM STEM industries. The panel included:

- **Vaadra Chavez,** *Chief Human Resources Officer*, Securin; formerly at Intel
- **Alex Greenberg**, *Economic Development Advisor,* NM Governor's Office
- **Kathy Keith**, *Director,* Community Partnerships Office, Los Alamos National Laboratory
- **Marcos Martinez,** *Deputy Secretary,* New Mexico Department of Workforce Solutions
- **Christian Slough**, *Business Development Manager,* Aqua Membranes, Inc.

The panel highlighted challenges and potential solutions related to the NM STEM workforce. Marcos Martinez shared compelling data from Workforce Solutions that are both promising and concerning, including:

- The labor force participation rate in NM is below the national average. The national average shows 62% of working age citizens are working, while New Mexico has 56% participating in the labor force.
- Currently, there are about 36,000 unemployed individuals in New Mexico and 65,000 job openings. If we were to get every unemployed individual working, we would still have an employment gap of about 23,000 jobs that we cannot fill.
- The average pay rate for STEM jobs in New Mexico is $108, 000 which is competitive with the national average. The average wage for non-STEM jobs in NM is $53,000. Currently, New Mexico higher education institutions are producing about 2,600 STEM graduates per year. The challenge that we're seeing is that New Mexico, at any given time, has about 4,600 STEM positions open.
- Additionally, the data show that New Mexico hires a lower percentage of STEM graduates from New Mexico institutions than the average seen nationally, and STEM students who graduate from New Mexico institutions are only half as likely to stay in New Mexico after they graduate.

Vaadra Chavez, Chief Human Resources Officer at Securin, shared how development of a STEM workforce begins in kindergarten. Because of system challenges including a high poverty rate, many students are not aware of the possibilities of pursuing a STEM career. Another challenge is connecting employers to the supply chain of students. STEM graduates need to know the employment opportunities available to them here in NM because companies are having difficulty connecting with NM STEM graduates and getting them to apply for open positions. For Securin, the ratio of NM applicants applying for STEM positions is 1:50+ compared to non-NM applicants. Industry, including small start-ups, need a hub to connect NM students to potential STEM jobs in NM.

Kathy Keith, Director of the Community Partnerships Office at Los Alamos National Laboratory, shared LANL's initiative for strengthening the pathway for New Mexicans to find employment at the national lab. The effort includes visiting local high schools to talk with students about high demand job opportunities at LANL, helping students see themselves in these careers, and painting a clear picture of how to get from where they are to the careers that interest them. As a result of their efforts, as of 2024, LANL has increased their workforce from 25% New Mexican to 65% New Mexican.

Christian Slough, Business Development Manager at Aqua Membranes, Inc., and Alex Greenburg, Economic Development Advisor to the Governor's Office, reiterated the need for centralized information and opportunities for students in rural areas to understand the job and internship opportunities available to them in our state and the need to connect smaller businesses (and those considering establishing a business in NM) to available resources and the local workforce. Mr. Greenburg also highlighted the need to de-silo skills and promote the integration of technical, social, and critical thinking skills for students to be successful in an evolving workforce.

Throughout the panel sessions, facilitators collected inspired ideas and reflections from the participants who attended in the morning. Those ideas are summarized below.

Overall, the industry experts provided a compelling case for the importance of building cross-sector collaboration to increase and strengthen STEM education in NM. STEM education in NM is an important economic driver for NM in the 21st century. STEM careers in NM are there for the youth; the work is to ensure that all youth have access to the in-school and out-of-school time opportunities that prepare them for the STEM positions available in NM (and beyond). It is also clear that our youth will be competing in a global market for STEM jobs, in NM and beyond. Their readiness begins in PreK and must focus on critical thinking, creativity, and problem solving.

The keynote and the panels generated much discussion and excitement among participants. There was steady support from K-12, out-of-school time , industry, government, Tribal, and community participants to create a STEM Innovation Network for NM.

Session II: Mapping & Visioning

In the afternoon, about 50 participants stayed engaged, in person and virtually, and collaborated to collect ideas and data for envisioning a STEM Innovation Network for New Mexico. The group spent time in small and large groups discussing and capturing thoughts about what obstacles, challenges and objectives this initiative will need to consider as it manifests. Then the group did some collective asset mapping to identify the organizations, spaces, people, cultures, and other resources that already exist in the community that can support the STEM IN NM initiative.

Main Ideas: Obstacles, Challenges, and Objectives

Funding and Sustainability: A clear challenge at the forefront of the conversations was finding consistent and sustainable funding for the implementation of STEM IN NM, as well as for the scaling up of the network infrastructure.

Equity and Accessibility: Another theme that arose from the conversations was ensuring that STEM IN NM would be known by and accessible to people in all parts of New Mexico, no matter how rural or remote. It's clearly important to ensure partnerships across school structures including public, private, charter, Bureau of Indian Education, and Tribal institutions. The resources and support that STEM IN NM offers should not fall into a one-size-fits-all model but, rather, be responsive to the diverse needs of the communities across the state.

Structure and Governance: Participants recognize the need for a clear and focused vision and an organized structure for STEM IN NM. They discussed ideas for how the Network might be structured to stay agile, transparent, and responsive. Participants asked, "Can it be non-hierarchical, using distributed leadership? Who will staff it? Where will it be housed? What are the focused objectives and how will they be decided and communicated?"

Buy-in and Cross-Sector involvement: Participants discussed the need for consistent buy-in from teachers and schools and districts (LEAs) as well as the challenges with high turnover rates of superintendents, principals and teachers in the public school system. Additionally participants discussed the importance of industry, K-12 educators, and higher education to come together consistently over time to align efforts and be responsive to students' and communities' needs.

Systems and Institutional Alignment: Participants want the leaders of STEM IN NM to understand that they will need to align their support with educators, industry, and policymakers. STEM IN NM should be the connective tissue for STEM education innovation in the state. In addition, it will be important for each region to have their own version of this alignment as they meet the needs in their communities and work to align with a broader statewide vision for STEM education and workforce development. Interaction between hubs and the principal hub will need to be bi-directional. A question the principal hub, regional and Tribal hubs will need to ask is, "How can STEM IN NM allow for regional autonomy but also maintain a focused and effective structure?"

For the specific comments collected for this section please see the photos in appendix B.

Asset Mapping NM's STEM Community:

New Mexico is rich with language and cultural assets as well as industry, technology, nonprofit organizations, foundations, institutions, government agencies, businesses, and individual leaders from all sectors who can help cultivate STEM education innovation throughout New Mexico. Participants generated a list of assets, based on their perspectives and positions, that can contribute to a STEM Innovation Network in NM. This collective set of lists provides a comprehensive start to mapping NM's STEM assets across contexts and sectors.

Note: This asset map is not complete. It was developed by participants at the convening, but the STEM Innovation Action Team recognizes that there are many entities and individuals who need to be added to this list. If you are reading this list, and know of entities or individuals that should be included, please email kersti@lanlfoundation.org. All suggestions are welcome as we continue to build this living asset map.

Cultural and Historical Context:

- Rich history as a State and People
- Diverse population
- Indigenous wisdom
  - Engagement through links with local traditions
  - Pueblos and their STEAM knowledge
- Regional Fiestas and Indigenous Holidays
- Traditional water, soil, and land use praactices
- Cultural Centers
- Institute of American Indian Arts (IAIA):
- Indian Pueblo Cultural Center (IPCC)
- Stories of New Mexicans:
- Labs and businesses showcasing cultural, rural/urban, and language-based stories Stories of individuals served by STEM organizations (e.g. NM MESA)

STEM and Education Highlights:

- College and Career Readiness Bureau:
  - Videos of stories about diverse careers
- STEM Stories in Media:
  - Film Prize Junior New Mexico (Film Prize NM)
  - TEDxABQ and TEDxED
- Explora
- Libraries
- NM MESA
- R4 Creating
- Future Focued Education (FFE) X3 Internships

Think Tanks and Collaborative Spaces:

- Q Station
- Rainforest Cafe
- Launch Pad (NewSpace Nexus, PIA from AFRL)
- UNM-Taos HIVE
- Northern NM Coalition for Workbased Learning
- CTE Statewode Advisory Board

Educational Approaches and Student Engagement:

- Meeting students where they are:
  - Students find inspiration in things relevant to their lives.
  - Convey empowerment with education that aligns with their culture.
  - Role models relatable to students.
- STEM teaching that is culturally & linguistically relevant to students, families, and communities.
- Place-based education.

Social and Community Issues:

- Multi/bi-lingual education
- Native American culture and social economics
- Tribal sovereignty
- Homelessness
- Forest fires
- Broadband access
- Water and agriculture
- Community needs
- Climate change

Story Collection and Sharing:

- Department of Cultural Affairs:
  - Collects and shares stories
- "Water Is Life" theme

Community and Tribal Leaders:

- Tribal Leaders
- Curriculum on Native Science (Dr. Gregory Cajete)
- NACA Inspired Schools Network (NISN)

Museums and Cultural Centers:

- Albuquerque Zoo & Botanical Gardens
- Atomic Museum
- Audubon Society
- Bradbury Science Museum
- Explora
- IAIA Museum of Contemporary Native American Arts & Culture
- National Museum of Nuclear Science & History
- National Hispanic Cultural Center
- Poeh Cultural Center & Museum
- Pajarito Environmental Education Center (PEEC)
- Patios outside museums, cultural centers, theaters, and art centers
- Natural History Museum
- NM State Museums
- NRAO Very Large Array (VLA)
- Santa Fe Children's Museum
- Space Museum
- International Folk Art Museum
- Santa Fe Botanical Gardens

Outdoor and Natural Spaces:

- Taos outdoors
- Bisti Badlands
- Volcanoes
- Carlsbad Caverns
- Bosque (Bosque Ecosystem Monitoring Program)
- Chaco Canyon
- City of Rocks
- Gila Cliff Dwellings
- Bandelier
- National Parks, National Forests; BLM; State Parks

Educational and Training Facilities:

- SFCC (Santa Fe Community College) for hydroponics
- Tucumcari Wind Training
- Schools and STEAM labs
- LANL Foundation
- Educational institutions (potential for donated office space)
- New Mexico Out-of-School Time Network training room
- Future Focused Education's (FFE) X3 Internships

Meeting and Event Spaces:

- Berna Facio (APS-owned)
- Convention Center (e.g., NM MESA uses it for competitions like Trebuchet)
- Film studio on Central (City of Albuquerque-owned; can be used for video projects)
- Sevilleta (Meeting spaces available)

Educators, Academic and STEM Leaders:

- Melba Acantilado
- Wanda Bulger-Tamez (NMSU)
- Pat Carden (MC2)
- Laura Crossey
- Dr. Nelia Dunbar (NM Bureau of Geology and Mineral Resources)
- Bonnie Frey
- Jan Frigo
- Cari Hushman (UNM COEHS)
- Dr. Anna Liobet (LANL)
- Dr. Martha Mitchell
- Sarita Nair
- Dr. Sharon Sessions (NM Institute of Mining and Technology)
- Heather Summers (Project ECHO, NMSTA)
- Eleanor Walther
- Dr. Donna Riley, Dean of Engineering at UNM
- Nicole Tobiason
- Kersti Tyson, PhD

Government and Legislative Figures:

- Rep. Meredith Dixon
- Rep. Yanira Gurrola
- Rep. Joy Garratt
- Rep. Dayan Hochman-Vigil
- Senator Harold Pope Jr.
- Rep. Debra Sariñana
- Senator Bill Soules
- Legislative Education Study Committee

Industry and STEM Advocates:

- Kim Allen Scheerer, EdD (NM MESA)
- Agbeli Ameko and his brother
- Elizabeth Coronado (LANL, founder of Girls in STEM program)
- Selena Connealy (EPSCOR)
- Dale Dekker
- Ling Faith-Heuertz (NM MESA)
- Anita Gonzales (NM MESA)
- Russ Fisher-Ives (Roborave)
- Amon Huerta (Explora)
- May Sagbakken (NMOST)

National and Higher Education Labs:

- National Laboratories
- Air Force Research Laboratory (AFRL)
- Los Alamos National Laboratory (Triad National Security, LLC)
- Sandia National Laboratories (SNL)
- Santa Fe Institute
- N3B (Newport News Nuclear BWXT Los Alamos)
- Comprehensive universities (UNM & NMSU)

Space and Aerospace Organizations:

- NewSpace Nexus and Pathways to the Stars
- Rocket Lab
- Blue Halo
- Northrop Grumman
- SpaceX

Notable STEM Supporters:

- Derek Benavidez
- John DiRuggiero
- Jack Jekoswki
- Christy Krenek (NMSTA)
- TK O'Geary
- Heather Summers
- Janet Williams (SWE)
- Agbeli Ameko (NM Science & Engineering Fair competitor)

Notable figures and inspirations:

- Agbeli Ameko (NM Science & Engineering Fair competitor)
- Robert Goddard
- Harrison Schmidt
- Jacob "Pepperseed" Torres

Renewables and Energy Sector:

- NMOGA (New Mexico Oil & Gas Association)
- Renewable energy
- Chevron
- PNM (Public Service Company of New Mexico - Jon Hawkins)
- Positive Energy Solar Company
- Freeport (Mining areas)
- SE NM (Oil and gas support)

Science and Research:

NRAO (National Radio Astronomy Observatory)

Government Agencies:

- DOE (Department of Energy)
- NNSA (National Nuclear Security Administration)
- White Sands Missile Range
- U.S. Army Corps of Engineers
- WIPP (Waste Isolation Pilot Plant)

Workforce and Cooperative Programs:

- Cooperative Educational Services (CES)
- Civil Air Patrol
- Workforce Development

Higher Education Institutions:

- Central New Mexico Community College (CNM)
- Dona Ana Community College (DACC)
- Eastern New Mexico University
- Luna Community College (Luna CCC)
- Navajo Technical University (NTU)
- NM Highlands University
- New Mexico State University (NMSU):
  - STEM Outreach Center,
  - MC2,
  - SERI,
  - STEM Ed Cluster Hires.
- NM Tech (New Mexico Institute of Mining and Technology)
- Northern New Mexico College (NNMC)
- Saint John's College (SJC)
- Santa Fe Community College (SFCC)
- Southwestern College (SWC)
- University of New Mexico (UNM):
  - Project ECHO
  - STEM-H
  - TODOS
  - ROSE
- UNM-Los Alamos (UNM LA)
- Western New Mexico University

Media and Communication:

- Netflix
- Social media companies (e.g., Meta/Facebook)

Technology and Engineering Companies:

- Bohannan Huston Inc. (Engineering firm)
- Deloitte
- Intel
- Leidos
- Raytheon
- Verus Research

Education Government Agencies:

- BIE (Bureau of Indian Education)
- EPSCoR (Established Program to Stimulate Competitive Research)
- HED (Higher Education Department)
- Legislative Education Study Committee (LESC)
- Math and Science Bureau (PED)
- Math and Science Advisory Council, PED (MSAC)
- NM PED (New Mexico Public Education Department)
- RECs (Regional Education Cooperatives)

Initiatives and Networks:

- BEMP (Bosque Ecosystem Monitoring Program)
- Santa Fe Watershed
- Northern NM STEAM Network
- NSF-funded projects
- New Mexico Out-of-School Time Network (NMOST)
- Advancing Young Women in STEM & NM Women in STEM Summit (hosted by NMOST)
- NM Partnership for Science & Math Education (NMPMSE)

Other Programs and Organizations:

- Asombro Institute
- EdRising
- Math Circles (Santa Fe and APS)
- NM Governor's STEM Challenge
- Quivira Coalition
- RoboRave (Russ Fisher-Ives)
- Toastmasters (communication and leadership skills development)

Foundations and Sponsors:

- Albuquerque Community Foundation
- Anchorum
- Cal Ripken
- Encantado Foundation
- Gates
- Google
- JF Maddox Foundation
- Kellogg
- LANL Foundation
- LOR Foundation
- McCune Family Foundation
- Meta
- NM Foundation
- Sandia Foundation
- TRIAD/LANL Community Partnership's Office

Associations and Nonprofit Organizations:

- ACEC (American Council of Engineering Companies)
- Acequia Association of NM
- DiverseIT
- Community Foundations
- Center for Transforming Education
- CNM Ingenuity
- Cultivating Coders
- College STEM Outreach Programs
- Girls Who Code
- Indigitize
- Intelligent Transportation Society of NM
- Junior League
- Justice Code
- IEEE (Institute of Electrical and Electronics Engineers)
- Kiwanis
- Los Luceros Historic Site
- MAX Q (outside Carlisle gate of Kirtland)
- NM Children's Museum
- NM Consortium
- NM MESA
- NMOST (New Mexico Out-of-School Time Network)
- NMPMSE (New Mexico Partnership for Math and Science Education)
- NMSPE (New Mexico Society of Professional Engineers)
- NMSTA (New Mexico Science Teacher's Association)
- R4 Creating
- Research Park (outside Eubank gate of Kirtland)
- ROCA
- Rotary
- Santa Fe Community Foundation
- Society of Women Engineers (SWE)
- Space Valley Foundation
- STEMarts Lab
- STEM Santa Fe
- Supercomputing Challenge
- Techqueria
- TRIO Programs
- True Kids One
- Twirl

If you are reading this asset map and have suggestions, or know of entities or individuals that should be included, please email kersti@lanlfoundation.org.
All suggestions are welcome as we continue to build this living asset map.

Key Themes:

The following themes for developing a STEM Innovation Network for NM emerged throughout the convening:

Strategic Focus and Organizational Structure:

- Principal Hub – Not "Central Hub"
- Regional Accountability:
  - Hold quarterly Stakeholder Sessions to keep regional hubs accountable to the communities they serve
  - Ensure autonomy for each regional hub while maintaining connected autonomy within the network
- Measured Collective Impact:
  - Ensure there is measurable collective impact, avoiding siloed efforts
  - Results-Based Accountability (RBA)

Capacity Building and Professional Development:

- Training and Development:
  - Train regional hubs collectively on specific STEM strategies
  - Build capacity for teachers in engaging STEM teaching
- Creating Pathways:
  - Develop pathways for students to see and understand STEM careers
  - Focus on students seeing themselves in STEM careers
  - Paint the picture of STEM career opportunities for students
- Transportation
  - Funding & systems for transportation for students to participate in STEM activities in school and out of school.
  - Like athletes, students throughout the state need access to transportation to support participation in Out-of-School STEM activities; In-school Field trips to STEM museums, industry, and field studies; STEM competitions, and more.
- Accesiblity
  - Access for students and families with disabilities (13-15% of population);
  - 8-9% of the STEM workforce identify as having a disability.

Regional and Community Focus:

- Asset Mapping:
  - Conduct asset mapping by region to identify strengths and needs
- Diversified Funding:
  - Diversify funding sources, including both public and private sectors
- Focus on Regional Needs:
  - Tailor initiatives to address specific regional needs and priorities
- Facilitate Necessary Convenings:
  - Organize Communities of Practice to foster collaboration and shared learning

Workforce and Career Development::

- Workforce Development:
  - Anticipate shifts in the workforce and adapt programs to meet evolving demands
  - Address the employment gap (23,000 jobs) by preparing students for STEM careers
- STEM Pipeline Development:
  - Create and nurture a pipeline for students with a regional approach
- Collaborative Industry and Education Efforts:
  - Encourage collaboration between industry and STEM education sectors to align workforce needs with educational outcomes

Innovation and Flexibility:

- Find innovation that connects to NM:
  - Create a K-12 Space Program:
    - Develop a space program for K-12 students to engage with STEM in a hands-on way
- Iterative Learning:
  - Focus on "Iterative Learning," which recognizes that programs will need to continually iterate to adapt to the rapidly changing nature of STEM careers
- Flexible Funding:
  - Ensure that funding is flexible enough to meet diverse and changing needs (e.g., transportation, emerging technologies)

Conclusion:

This convening brought together cross-sector participants to learn about and envision a STEM Innovation Network for NM. The enthusiastic participation of in-person and virtual participants was an affirmation of the cross-sector interest in developing a networked approach to transforming STEM educational opportunities for every student in New Mexico, PreK-20, and recognition that in-school, out-of-school, and career pathways must work in concert. In doing so, NM has the potential to spur workforce and economic development throughout the state, while also preparing citizens to participate as critical thinkers and creative problem solvers who draw on the unique histories, cultures, and languages from throughout NM.

The STEM IN NM Convening was an important step in this journey that provided a space for collaborative planning and knowledge sharing. Dr. Perea Warniment, President & CEO of the LANL Foundation, emphasized the importance of a STEM education that will help NM to thrive into the 22nd century by expanding and deepening students' opportunities to participate in the local/global economy, as well as to ensure that NM's citizens are savvy and ready to participate in the technological/scientific society we live in. Leaders from Ohio, Louisiana, and Michigan STEM Networks helped participants learn about other states' efforts to innovate STEM education in their states – also driven by an imperative to prepare the next generation of workers and citizens, including underserved populations identified in the Martinez-Yazzie lawsuit. Lastly, experienced industry and government representatives helped participants understand that the need for a STEM Innovation Network is now. These industry partners were clear-eyed about the integral connection between PreK-20 STEM education innovation and STEM economic development. Transforming STEM education is vital for ensuring NM's citizens, communities, businesses, and industries thrive throughout the 21st century and into the 22nd century.

A STEM Innovation Network is a 21st century solution to support the ongoing transformative work that will keep education relevant in a fast moving, ever evolving local and global society. Throughout the convening, it was clear that the participants solidly believe in the brilliance of NM's youth and take pride in the diversity that is NM, celebrating and uplifting the languages and cultures throughout NM that make NM what it is. As the STEM Innovation Network develops it will be vital to recognize and integrate culture and language in responsive and responsible ways throughout STEM IN NM's initiatives. Culturally and linguistically sustaining practices ensure that our children and youth have the opportunities they need to enter the 21st & 22nd century societies they will encounter grounded in who they are based on their families and communities, ready to participate and compete globally because of the fact that they are New Mexican.

Appendix A: STEM Innovation Network for NM Convening Agenda

Agenda

Together, we can innovate STEM education and expand STEM career pathways to foster economic development and citizenship in our state.

8am - 4pm at the Hotel Albuquerque in the Franciscan Ballroom;
800 Rio Grande Blvd. NW, Albuquerque, New Mexico 87104
We are grateful to the Encantado Foundation for supporting this convening.

Agenda Session 1:

8am Nourishment and Networking – Breakfast Buffet

9am Welcome to the STEM Innovation Network for NM Convening

- **Dr. Gwen Perea Warniment**, *President & CEO*, LANL Foundation
- **Louis Jeantete**, *Executive Director*, Encantado Foundation

Panel: Standing on the shoulders of giants: What STEM Networks are accomplishing in other states

- **Dr. Clint A. Coleman**, *Program Administrator*, LASTEM
- **Megan Schrauben**, *Executive Director*, MiSTEM
- **Heather Sherman**, *Director*, STEMx National Network
- **Moderator: Kersti Tyson, PhD**, *Director of K-12 Education*, LANL Foundation

Small Group Discussion: Idea generation for NM's STEM Innovation Network

Panel: Building Tomorrow's Workforce Through the STEM Innovation Network:
Expanding the STEM Talent Pipeline for Economic Growth and Industry Innovation

- **Vaadra Chavez**, *Chief Human Resources Officer*, Securin
- **Alex Greenberg**, *Economic Development Advisor*, Governor's Office
- **Kathy Keith**, *Director of the Community Partnerships Office*, Los Alamos National Laboratory
- **Marcos Martinez**, *Deputy Secretary*, NM Department of Workforce Solutions
- **Christian Slough**, *Business Development Manager*, Aqua Membranes
- **Moderator: Monica Sandoval-Johnson, PhD**, STEM Boomerang

Individual Reflection & Whole Group Discussion: Needs and Opportunities for NM's STEM Innovation Network

11am Closing of Session 1

Break

Agenda Session 2:

11:30 am Opening of Session 2

Deep Dive to inform the STEM Innovation Network for NM's Development & Implementation

12:15 pm Lunch

1:00pm *Individual, small group, and whole group work:*

What will success look like?
What obstacles or challenges might there be?
Asset mapping and solutions

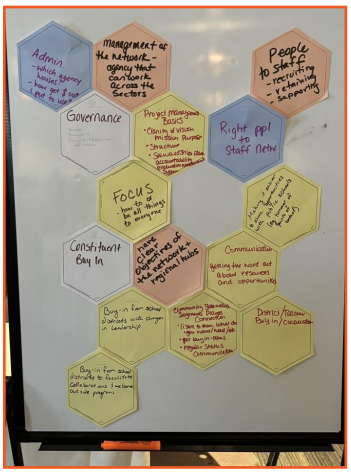
Next steps

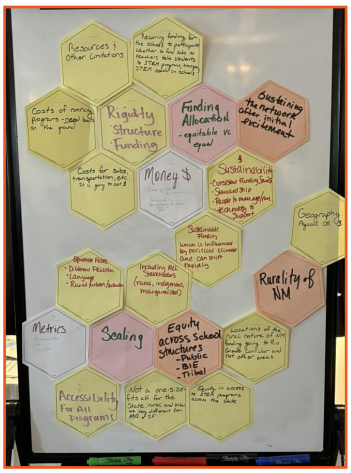
4pm Close Session 2

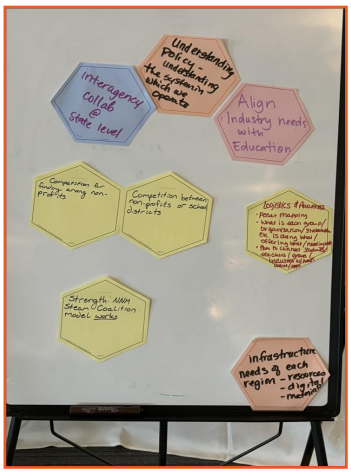
Thank you to Zach Taylor, Institute Director, Center for Transforming Education, for facilitating this convening.

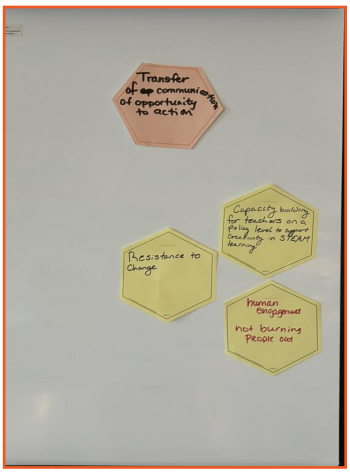
Please contact kersti@lanlfoundation.org / 505 818 7510 if you need anything!

Appendix B: Participants' contributions from the Obstacle, Challenges, and Objectives group discussions.









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