

STEM+

Center for Teaching and Learning

A NM CENTER OF EXCELLENCE

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New Mexico State University

Enhancing Statewide STEM Education



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Background

- In 2018, NMSU challenged faculty and staff to identify Grand Challenges that could lead to opportunities for local application.
- One of the singular focus areas identified was the need to enhance statewide STEM teaching and learning.
- Building on a proven model of the DOE National Laboratories, NMSU set out to identify strategies to effectively address a need for large, complex multidisciplinary research to affect transformational change in the way NM addresses STEM teaching and learning.
- Foundational to this strategy is to enhance student learning outcomes and foster Best Practice for statewide STEM teaching practices to ensure all students have access to quality learning experiences.
- In 2021, NMSU established the College of Health, Education and Social Transformation (HEST) with a focus on improving individual, societal, and policy outcomes. This new College blends expertise in education, health and social sciences to create a “distinctive”, truly interdisciplinary solution-oriented college with social justice commitment.
- NMSU, working with our partner higher-education institutions across the state, is focused on elevating access and engagement in STEM+ teaching and learning to foster social economic mobility for New Mexican of all ages.



STEM+ Center for Teaching and Learning

Mission and Vision

Serving the educational needs of New Mexico's population through culturally, geographically and demographically responsive research in STEM teaching and learning..

Broaden and increase student participation in K-16 STEM

Engagement in problem-solving co-curricular activities
Engagement in career awareness programming

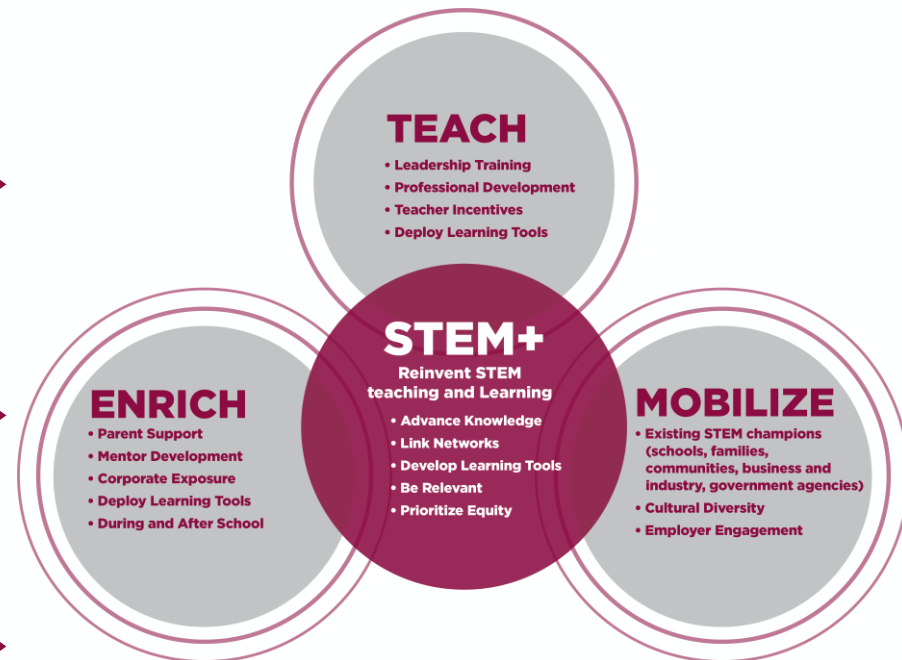
Foster Multi-disciplinary research in STEM Teaching and Learning

Build on and Unify "pockets of excellence"
Identify opportunities for scale and replication

Create Community-based network

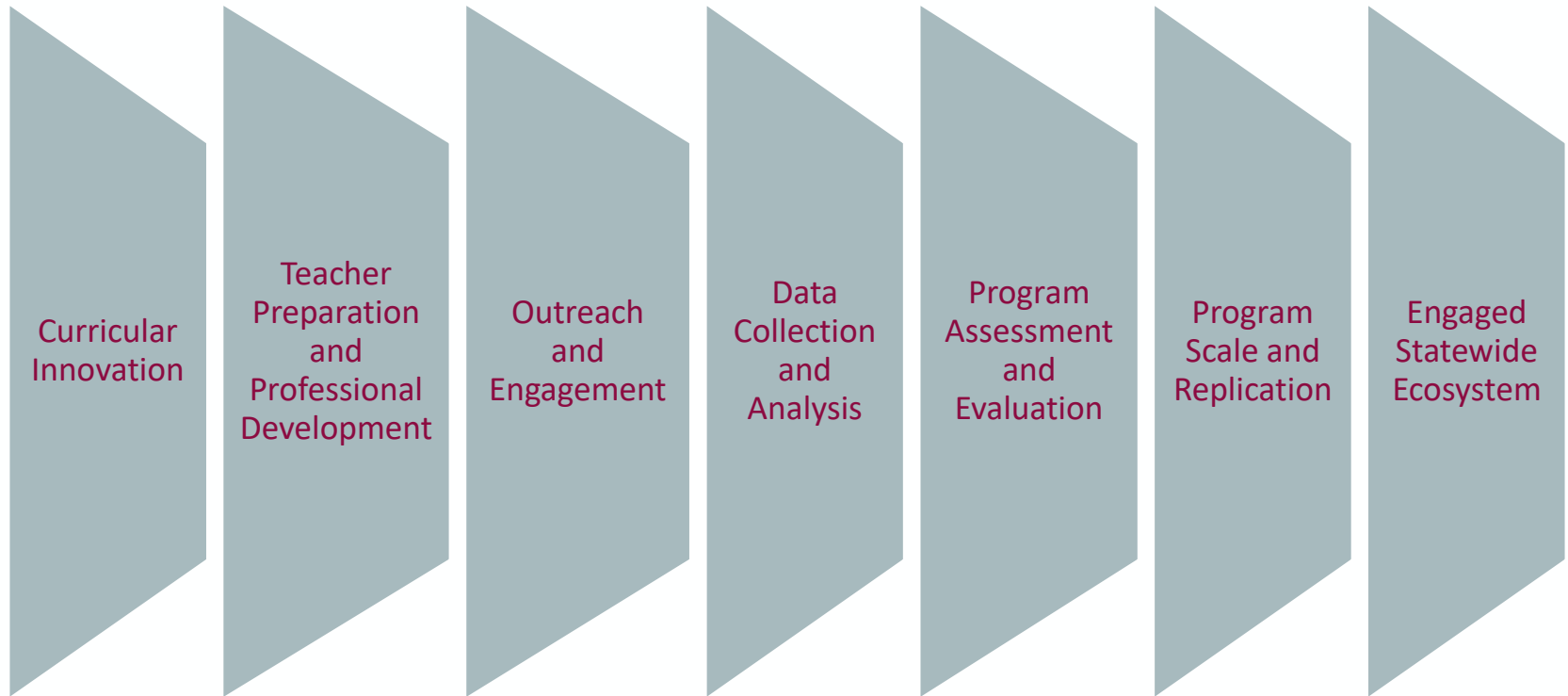
Engage educators across K-16
Engage students across K-16
Engage communities and employers

Theory of Change



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Focus on Teaching and Learning



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Mobilize Community Engagement

Student Engagement

- Foster a collaborative network among existing STEM+ Outreach Programs and Competitions
- Increase participation in internships and apprenticeships through CTE programming

Curricular Innovation

- STEM+ Center for Teacher and Learning
- Anchor regional engagement through partnered higher education institutions
- Teacher Professional Development
- Leadership Development for School Administrators

Family and Community Engagement

- Career Technical Student Organizations (CTSOs)
- Industry Partners (mentoring, judges in STEM competitions, career awareness)
- Local Government Agencies (leverage existing funding sources)
- NGO Community



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Measuring Success

Secondary Education

Integrate project-based learning within curriculum

Enhance computer and technology literacy

Create STEM experiential learning opportunities

Increase student engagement in STEM outreach and competitions

Increase STEM Career exploration and awareness

Post-secondary Education

Build STEM Capacity

STEM Teacher Pre-service professional development

Articulated pathways for high school and transfer students

Professional Development for Guidance Counselors on STEM Career advising, with emphasis on diversity and inclusion

Innovative curricula that fosters computer and technology literacy in the classroom

Employers

Cross-cutting engagement with STEM+ Center for Teaching and Learning

- Mentorship
- Event and competition judges
- Career Awareness
- Apprenticeships, internships, Co-Ops


Increase employer knowledge of STEM education in NM


- Alignment of education and training initiatives
- Increase awareness of micro-credentialing as a resource to upskill, reskill and new skill current workforce





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NMSU LEADS 2025 Alignment

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LEADS Goal 1
Fostering Student Success
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LEADS Goal 2
Elevate Research on STEM Teaching and Learning
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LEADS Goal 3
Engage K-12 schools, community, families and employers
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LEADS Goal 4
Create a connected network of educators focused on meeting a state-wide need

METRICS FOR SUCCESS

 <p>Increase number of students engaged in STEM</p> <ul style="list-style-type: none"> ○ Number of undergraduate students participating in STEM-based experiential learning activities. ○ Number of students participating in experiential learning that align with NM target industry sectors. ○ Increase in STEM identity – confidence and interest in STEM career fields. ○ Increase demographic diversity. 	 <p>Foster Best Practice in STEM teaching and learning that can be scaled and replicated</p> <ul style="list-style-type: none"> ○ Number of graduate students participating in STEM teaching and learning research. ○ Number of faculty actively participating ○ Number of STEM teaching and learning proposals submitted. 	 <p>Elevate engagement across all stakeholders in STEM teaching and learning</p> <ul style="list-style-type: none"> ○ Number of participating schools. ○ Number of K-12 students participating in STEM outreach programming. ○ Increase demographic diversity. ○ Number of teachers participating in STEM teaching and learning professional development. ○ Number of participating employers.
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Statewide Impact

As evidenced in Yazzie-Martinez vs the State of New Mexico, the “vast majority of New Mexico’s at-risk children finish each school year without the basic literacy and math skills to pursue post-secondary education or a career.” There is a critical need to foster *Community-Based* participatory engagement that brings together students, faculty, employers, and community members to elevate and enhance access to quality STEM teaching and learning statewide, and broaden awareness about career options for New Mexico’s youth.

STEM+ directly addresses these concerns, and supports additional challenges outlined in the multi-year NM Economic Development Strategic Plan (*Empower and Collaborate: New Mexico’s Economic Path Forward*) to increase and broaden participation in STEM-based education and degree attainment as a means of elevating high-wage employment in the state.



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Scaling “Pockets of Excellence”

Gadsden Independent School District (GISD) Case Study

- Prior to 2001, the GISD profile comprised a student enrollment that was 92% minority. Of the total student enrollment, 94% qualified for Free and Reduced School Lunch Program, and high schools were faced with high drop-out rates, as early as middle school. Further, nine of the twelve elementary schools and three middle schools were facing probationary status with NM PED, and 75% of the students scored below Proficient on state mandated tests.
- In 2001, a partnership between NMSU and GISD was founded through a National Science Foundation Grant. The partnership set out to develop a *Sustainable School and Community-based Model* to support implementation of curriculum and instruction aligned with NM Education Standards and the National Council of Teachers of Mathematics Curriculum and Professional Development Standards with an overarching goal of elevating student learning outcomes across the District.
- From 2001 – 2022, NMSU and GISD have grown this partnership to include adoption and integration of a vast and diverse portfolio of intervention strategies to support and grow the *Sustainable School and Community-based Model*, including a shared commitment to “pivot” when needed to meet emerging challenges and opportunities.
- In 2022, NMSU enlisted a team of researchers to develop and conduct a “Case Study” review of intervention strategies adopted by GISD over the past 20 years. The objective of the Case Study review is to identify Best Practices and conditions for scale and replication in school districts across NM.

2021-22 GISD Profile

28 schools serving 12,844 students

98% minority enrollment

14:1 Student-Teacher Ratio (911 Teachers)

20 Full-time school counselors

84% High School graduation rate

Highest concentration of top ranked public schools in NM

Within top 50% of NM top ranked public schools

Source: <https://www.publicschoolreview.com/new-mexico/gadsden-independent-schools-school-district/3501080-school-district>



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Moving Forward

- Multi-faceted funding approach
 - Establish STEM+ Center for Teaching and Learning as an official NM Center of Excellence (one-time request of \$2 million)
 - Establish recurring funding through NMSU Research and Public Service line-item request (\$500k per year)
- Socialize Center of Excellence with Council of University Presidents to identify areas for collaboration among higher education institutions
- NMSU has invested in 5 new interdisciplinary faculty positions focused on STEM+ teaching and learning. Search process is currently underway
- STEM+ will establish an external Advisory Board to support statewide teaching, learning and workforce alignment.



To learn more about the STEM+ Center for Teaching and Learning,
please contact:

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