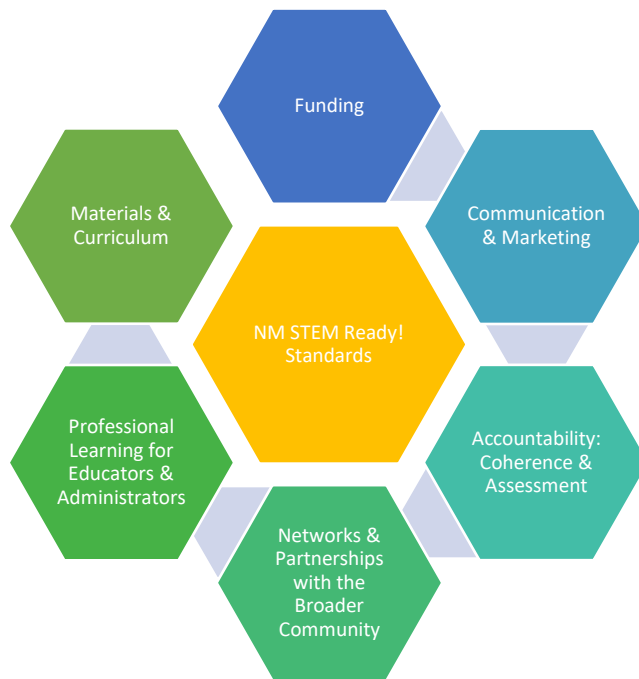**Key Components Necessary for Implementation of the NM STEM Ready! Standards**

According to the National Academy of Sciences' *Guide to Implementing the Next Generation Science Standards*, the following seven principles reflect best practice for robust systemic transformation.

1) Ensure coherence across levels (state, district, schools), across grades, and across different components of the system—curriculum, assessment, instruction, and professional development.
2) Attend to what is unique about STEM.
3) Develop and provide continuing support for leadership in science at the state, district, and school levels.
4) Build and leverage networks, partnerships, and collaborations.
5) **Take enough time to implement well. This includes structures that build reflective communities of practice.**
6) **Make equity a priority.**
7) Ensure that communication is ongoing and relevant.

I would add the following four given New Mexico's context and particular challenges based on our experience at the LANL Foundation:

1) Attend to teacher and administrator turnover (upwards of 30%) and embed recruitment and retention strategies to the implementation plan. In addition, plan for sustained integration of new teachers each year.
2) Begin with asset mapping and leverage locations of strength in STEM across New Mexico.
3) Attend to New Mexico's rural districts. Seek and develop innovative practices in support of rural teachers and students. Collaborations, technology, teacher cadres, and university partnerships are critical to the success of our rural districts.
4) Incorporate higher education. A particular area of growth is the lack of content knowledge in STEM for our teachers. Teacher preparation programs should bridge with PreK-12 systemic needs. A dynamic, healthy system requires stronger feedback loops among learning sciences, teacher prep, and Prek-12.

According to the New Mexico Math & Science Advisory Council (MSAC), STEM education in our state needs:

1) A unified statewide vision for STEM education.
2) High educational performance for all NM students.
3) High academic standards and aligned assessments.
4) Highly-trained STEM teachers for all students.
5) STEM learning opportunities for all grade levels in the school environment.
6) Out-of-school STEM learning.

2017-2018 New Mexico Math & Science Student Assessment Data

In summary, mathematics scores are increasing in the state with the exception of 10th grade. More students met or exceeded expectations for the 2017-2018 SY than in the past four years. Math assessment scores show students that are of Hispanic and American Indian ethnicities perform well below those students with Caucasian ethnicity. In general, Hispanic students are performing at about 50 percent of the level of Caucasian students and American Indian students at about 30 percent of the level of Caucasian mathematics students at the 11th grade.

Science assessment data show gender differences in the development of science skills, particularly in grade 11 where 25 percent of females scored as proficient or advanced and 30 percent of males scored similar. This same disparity is identified when comparing Caucasian student data to Hispanic and American Indian student data. When looking at 11th grade science data, Caucasian students outperform Hispanic and American Indian students. Caucasian students perform as proficient or advanced 50 percent of the time, Hispanic students 22 percent, and American Indian at 15 percent.
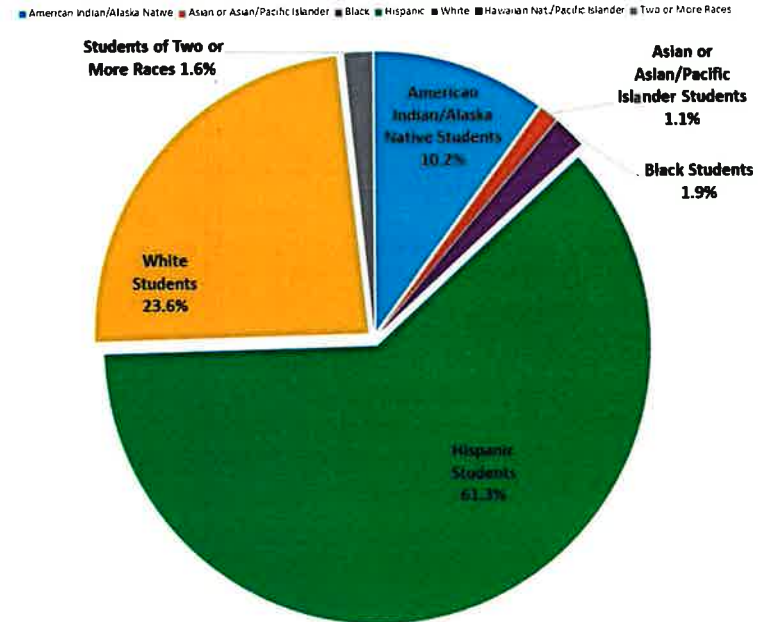
As current research indicates, those students that are less well served show smaller academic growth through time. Concerns remain with the particular populations that are strongly represented in New Mexico of Hispanic, American Indian, English language learners, and economically disadvantaged students that serve as a high percentage of the state's student population.

MSAC Advisory Council

Wanda Bulger-Tamez : NMSU STEM Outreach Center
Bernadine Cotton : Las Cruces Public Schools teacher
Christy Krenek : Santa Fe Public Schools
Scott Robbins : Los Alamos National Labs
Kim Allen Scheerer : NM MESA Inc.
Anna Suggs : LCPS teacher & NMSTA President
Gwen Warniment : LANL Foundation

NEW MEXICO STUDENT DEMOGRAPHICS
American Indian/Alaska Native ■ Asian or Asian/Pacific Islander ■ Black ■ Hispanic ■ White ■ Hawaiian Nat./Pacific Islander ■ Two or More Races

- Students of Two or More Races 1.6%
- American Indian/Alaska Native Students 10.2%
- Asian or Asian/Pacific Islander Students 1.1%
- Black Students 1.9%
- White Students 23.6%
- Hispanic Students 61.3%

U.S. STUDENT DEMOGRAPHICS
American Indian/Alaska Native ■ Asian or Asian/Pacific Islander ■ Black ■ Hispanic ■ White ■ Hawaiian Nat./Pacific Islander ■ Two or More Races

- Hawaiian Nat./Pacific Islander Students 0.4%
- Students of Two or More Races 3.4%
- Asian or Asian/Pacific Islander Students 5.0%
- Black Students 15.3%
- White Students 48.5%
- American Indian/Alaska Native Students 1.0%
- Hispanic Students 26.4%

STEM Ready!