New Mexico Partnership for Math and Science Education
Math Priority Areas to Transform Math Education in NM
Legislative Education Study Committee
July 2024 Working Draft

Purpose: Over the past decade, schools, districts, higher education and the NMPED have been working to improve outcomes in mathematics education by implementing the many research-based recommendations embedded in the NMPED Math Framework, PED Strategic Plan, and the Martinez/Yazzie Lawsuit, among other documents. However, due to the transformations in practice these recommendations call for, they have not been realized at scale. To develop the structures and systems needed to systematically improve children and youth's opportunities to learn mathematics, the New Mexico Partnership for Math and Science Education (NMPMSE) established a working group and has developed recommendations in three priority areas to address the needed transformation at scale.

Timeline for Action:

- **August 15, 2023**: First draft is complete and sent to NMPMSE Board Members for review/awareness/feedback.
- **August 31, 2023**: Working groups are formed. Each group identified the stakeholders and invited them into the group.
- **September 14, 2023 -** Pat and Heather to facilitate meeting on PA2
- **October 9, 2023 -** Zach to facilitate meeting on PA3
- **November 13, 2023 -** Kersti to facilitate meeting on PA1
- **December 1, 2023**: Draft policy recommendations due from each working group; presented to NMPMSE Annual meeting.
- **January - March, 2024**: Incorporated feedback and refined the plan
- **April/May, 2024**: Shared with stakeholders to prioritize recommendations; Presented updates NMPMSE Board.
- **May - July, 2024**: Present recommendations to the LESC Interim Committee.
- **August 2024**: Incorporate feedback and refine. Identify policy levers (i.e. statutory & regulatory).
- **September 2024**: Identify legislation and funding request for 2025 Legislative Session
- **September 2024**: Present draft legislation and priorities to the NM Chamber of Commerce.
- **December 2024**: Share updates and refine with NMPMSE members at annual meeting
- **January 2025 and beyond**: Introduce legislation and continue to refine and build awareness and action to systematically transform children's opportunities to learn mathematics and see themselves as "math people."

Priority Areas

1. Educator Preparation
2. In-service Math Professional Learning and Continuous Improvement
3. Math Leadership

Two additional priority areas on graduation requirements and communication strategies were identified by NMPMSE but are outside the scope of the NMPMSE Math Policy Working Group.

Priority Area 1: Educator Preparation

Driving Questions: (1) Do pre-service teachers in traditional and alternative pathways have systematic access to learn math content and pedagogies that support them to teach math that is aligned with national and state standards and recommendations? (2) Are student teachers mentored by master teachers using aligned effective mathematics teaching practices? and (3) Are level 1/ 1A teachers supported to enact aligned and effective mathematics teaching practices in their first years in the profession?

Problem:

Mathematics education has undergone a research-based transformation over the past 25 years, shifting from a procedural approach of teaching mathematics, to an approach that integrates students' conceptual understanding, procedural fluency and the application of mathematics. This approach draws on and supports students' developmental understanding of the mathematics they are learning. This shift poses challenges and opportunities for both pre-service teacher preparation programs and in-service teachers who host teacher residents and interns in their classrooms, and who mentor beginning teachers.

Pre-service teachers in NM's traditional undergraduate programs are required to have six hours of mathematics content and three hours of mathematics methods. There is no requirement for mathematics content nor methods in alternative licensure programs, although some programs require it. In addition, it is unclear how aligned mathematics methods courses are to national standards and recommendations set forth by the National Council of Teachers of Mathematics (NCTM), the Association for Mathematics Teacher Educators (AMTE) and TODOS:Mathematics for All. The result of inequitable implementation of these standard professional practices is that many new teachers enter the classroom without professional knowledge, skills, dispositions and practices that ensure diverse children and youth thrive as learners of mathematics.

Conversely, the relationship between pre-service programs and the in-service teachers who host pre-service teachers as residents, in fieldwork, or beginning teacher mentors is not always aligned. In some cases pre-service teachers learn math methods that align with national standards and recommendations, but then they are placed in classrooms where teachers use different methods to teach mathematics, and pre-service teachers are not supported to enact the practices they are learning in their teacher preparation program - and vice versa. Too often there is a mismatch between pre-service methods and in-service methods. Transforming the pre-service preparation for mathematics education requires supporting both teacher preparation programs, cooperating teachers, and teacher mentors to align their practices. Support for Cooperating Teachers, Mentor Teachers, and Math Teacher Educators to align practices is needed so that the

methods pre-service teachers are learning in methods courses align with the methods they see in their field placements; it is important that this relationship recognizes that in-service teachers, pre-service teachers, and mathematics methods faculty all have experience, skills, knowledge, and practices that contribute to this alignment.

Policy Recommendations:

1. Require **three hours of math methods** for traditional *and* alternative licensure teachers aligned to state and national standards for teaching mathematics.
    a. Change the alternative licensure statute (NMAC **6.60.3.9)** to require at least one 3-credit mathematics methods course for all PreK-8 teachers and secondary mathematics teachers in alternative licensure (it is already a requirement for traditional teacher preparation programs).
    b. Update requirements for licensure to include alignment to National Standards of Practice for teaching mathematics (NCTM, ACTE and TODOS).
    c. Funding: Teacher prep programs and pathway programs and accreditation staff (PED) will need support to review and/or develop math methods courses.
    d. Criteria for success: All elementary and secondary teachers will successfully complete a 3 credit hour mathematics methods course aligned to state and national standards of practice.

2. Provide collaborative high quality professional learning opportunities for cooperating teachers (who work with pre-service teachers), mentor teachers (who work with beginning teachers), and pre-service education faculty (who work with pre-service and in-service teachers) aligned to NCTM's Effective Mathematics Teaching Practices
    a. Policy Lever: As a part of accreditation for teacher prep programs, require math methods faculty and cooperating teachers to collaborate to align practices and expectations for teaching mathematics aligned to NM Math Framework and National Standards of Practice for teaching mathematics.
    b. Teacher Prep programs will need funding to support cooperating teachers, faculty, including adjunct faculty, and beginning teacher mentors to participate in National Standards alignment efforts. To pilot, provide funding to 3-5 teacher preparation programs to develop and pilot processes and structures that ensure cooperating/co-teachers/mentors and methods faculty align practices with National Standards; NCTM/AMTE/TODOS, including stipends to cooperating teachers and adjunct faculty.
    c. Provide funding for incentives for cooperating teachers and pre-service teachers to attend mathematics professional development aligned to National Standards; NCTM/AMTE/TODOS (i.e. math echo, micro-credentials, MC2).
    d. Provide funding for incentives for mentor teachers and first, second or third year teachers to attend mathematics professional development aligned to National Standards; NCTM/AMTE/TODOS (i.e. math echo, micro-credentials, MC2).
    e. Criteria for success: NM's pre-service, alternatively licensed teachers, and beginning teachers have access to coursework, fieldwork and mentoring that is aligned to state and national standards for teaching mathematics.

Priority Area 2: In-service Math Professional Learning and Continuous Improvement

Driving Question: How can we support structural and cultural change within schools to support the necessary shift in mathematics teaching and learning required to meet the demands of New Mexico's Mathematics Standards (Common Core State Standards for Mathematics).

- How do we implement effective on-going job-embedded professional learning in schools that are aligned to state and national standards of practice?
- How can we leverage Elementary Math Specialists or Instructional Coaches to support math education transformation aligned to state and national standards of practice in all NM elementary schools?
- How can micro-credentials be leveraged to support the ongoing professional learning for math education transformation aligned to state and national standards of practice in PreK-12?

Problem: NM documents such as the PED Math Framework, the PED Strategic Plan, and the Martinez/Yazzie Lawsuit and subsequent Action Plan clearly articulate what should and can be done to help improve teaching and learning in NM. NM's mathematics teachers (PreK-12), need access to the following PL essentials for improving mathematics teaching and learning at scale.

Darling-Hammond, Hyler and Gardner (2017) describe seven tenets of professional learning. Professional learning:
- ❖ Is content focused
- ❖ Incorporates active learning utilizing adult learning theory
- ❖ Supports collaboration, typically in job-embedded contexts
- ❖ Uses models and modeling of effective practice
- ❖ Provides coaching and expert support
- ❖ Offers opportunities for feedback and reflection
- ❖ Maintain a sustained focus and duration

Policy Recommendations:

1. Require high quality on-going job-embedded math professional learning for Level 1, 2, and 3 licensure holders every 5 years aligned to National Standards of Practice (NCTM).

    a. Require at least one math content & pedagogy micro-credential aligned to state and national standards; NCTM/TODOS/NM State Frameworks (and approved by MSAC and/or a professional standards board*) to move from Level I to Level II licensure (we think similar requirements could be built in for other content and pedagogical areas).

    b. Require at least two math content & pedagogy micro-credentials aligned to state and national standards; NCTM/TODOS/NM State Frameworks (and approved by MSAC and/or a professional standards board*) to renew all level II licenses every 5 years (we think similar requirements could be built in for other

content and pedagogical areas).

       c. Require at least two math content & pedagogy micro-credentials aligned to state and national standards; NCTM/TODOS/NM State Frameworks (and approved by MSAC and/or a professional standards board*) to renew all level III licenses every 5 years (we think similar requirements could be built in for other content and pedagogical areas).

2. Create structures within schools to support high quality job-embedded ongoing professional learning for all PreK-12 teachers aligned to National Standards of Practice (NCTM).

       a. Create micro-credentials (online grade-level statewide communities of practices) aligned to national and state standards of practice (e.g. NCTM's Eight Effective Mathematics, including grade level math content, rich tasks, pedagogy, analysis of student work). Ensure that micro-credentials align with best practices in professional learning aligned to NCTM/TODOS/NM State Frameworks.

       b. All mico-credential courses in mathematics (and all STEM) will be approved by a professional board (i.e. MSAC).

*If a professional standards board is used, the content specific micro-credentials need to be reviewed and approved by a group of individuals with the expertise to know the national and state professional standards for that content area (i.e. experienced teachers and faculty from colleges of education and content specific higher education).

       c. Create a 60/40 school schedule. This refers to 60% of teachers' time in front of students and 40% of time engaged in collaborative professional learning and continuous improvement activities.

3. Ensure every school has a Math Specialist to support implementation of the high quality job-embedded ongoing professional learning for all PreK-12 teachers aligned to National Standards of Practice (NCTM).

       a. Provide a pathway to certify 300 new Elementary Math Specialists (EMS) by 2027, and support the current teacher leaders, instructional coaches, math specialists' on-going professional growth. The goal is to have an EMS at every elementary school in NM by 2032.

       b. Train and certify 100 new Secondary Specialist Math Specialist/coaches by 2028, including developing the Secondary Math Specialist Endorsement.

3. Create a NM STEM Innovation Network that supports a platform for teachers to access on-going professional learning for teaching mathematics and for New Mexico professional learning providers, (RECs, LANL-MSA, MC^2, Project ECHO, higher education, teacher preparation programs, MSAC, NMPMSE, and others) to ensure consistency in implementation and outcomes aligned to NCTM/AMTE/TODOS practices.

Funding Recommendations:

1. Fund PED infrastructure to support micro-credential administration, including approval of micro-credential by MSAC/a professional standards board (the LMS team at PED has developed an infrastructure for math micro-credentials for badges on teaching license)
2. Fund programs to develop micro-credentials; fund partnerships to develop consistent micro-credentials implementation and access.
3. Explore what funding is needed to equitably support teachers to pay for the micro-credentials needed to maintain their license.
4. Provide incentives for elementary teachers to engage in yearly on-going professional learning opportunities focused on NCTM/AMTE/TODOS practices (e.g. NCTM's Eight Effective Mathematics Teaching Practices (NCTM's Principles to Action, 2014), Common Core Content State Standards, and the Student Mathematical Practices).
5. Fund math teachers to obtain a Masters in Math Teacher Leadership, Masters in Elementary Math Specialist or an Elementary Math Specialist endorsement.
6. Fund the development of the Secondary Math Specialist Endorsement in year 1. Fund secondary math teachers to obtain Secondary Math Specialist endorsement.
7. Provide funding for a NM STEM Innovation Network that supports a platform for teachers to access on-going professional learning for teaching mathematics and for New Mexico professional learning providers, (RECs, LANL-MSA, MC^2, Project ECHO, higher education, teacher preparation programs, MSAC, NMPMSE, and others) to convene at least three times a year to ensure consistency in implementation and outcomes aligned to NCTM/AMTE/TODOS practices.

Criteria for Success:

All teachers who teach math will complete micro-credentials and receive badges on their teaching license aligned to National and State Standards of Practice to maintain their professional license.

- By 2028 student math proficiency scores will increase by 25%.

Priority Area 3: Leadership

The role of a school leader is not only filled by an administrator but by any educator with the necessary knowledge and skills to support an environment of mathematical success. Teacher leaders, instructional coaches, school and district administrators, and state education leaders ensure that all educators share a vision and understanding of high quality mathematics instruction. These same education leaders work to ensure that every educator has the necessary knowledge, skills, and resources to meet the expectation of meaningful mathematics learning experiences. Leaders advocate for teaching and learning needs and continual, job-embedded collaborative professional learning.

Driving Question: How can we support structural and cultural change within schools to support the necessary shift in mathematics teaching and learning required to meet the demands of the NM CCSS?

- How does leadership provide structures for effective on-going job-embedded professional learning in schools?
- How can leaders leverage Elementary Math Specialists or Instructional Coaches to support math education transformation in all NM elementary schools?
- What supports do leaders need to learn and understand the instructional shifts teachers will be implementing in their classrooms?

Problem: NM documents such as the PED Math Framework, the PED Strategic Plan, and the Martinez/Yazzie Lawsuit and subsequent Action Plan clearly articulate what should and can be done to help improve teaching and learning in NM. School Board members, Superintendents, and Principals need support for developing the structures and systems essential for improving mathematics teaching and learning at scale.

a. High quality on-going professional learning that helps them be the instructional leaders for mathematical content and pedagogy aligned to national and state standards of practice.
b. Ensure leaders know and understand how to implement and put in place job-embedded professional learning (PLC structures, effective math teaching frameworks, the analysis of student work, math study cycles, and intervention design, etc.), and

Policy Recommendations:

1. Support leadership to create structures within schools to ensure high quality job-embedded ongoing professional learning for all PreK-12 teachers aligned to National Standards of Practice (NCTM).
2. Modify the teacher and principal evaluation system to include NCTM's Effective Mathematics Teaching Practices.
3. Establish collaboration between the principal licensure providers to ensure consistency in leadership development.

4. Create and provide financial support for a "NM STEM Innovation Network" that

supports and funds in-person collaboration three times per year between New Mexico professional learning providers, (RECs, LANL-MSA, MC², Project ECHO, higher education, teacher preparation programs, MSAC, NMPMSE, and others) to ensure consistency in implementation and outcomes aligned to NCTM/AMTE/TODOS practices.

Funding Recommendations:

- Fund 25 pilot schools to redesign their school week to meet the criteria of the 60/40 model professional learning model. This model would be articulated in a guiding document and schools could work toward a *Math Leadership School Designation.* Incentives could be provided for achieving the designation and sustaining progress.
- Fund professional learning for instructional leadership & supervision within a culture of professionalism and continuous improvement.
- Fund a pilot program for 50 principals to participate in principal residency programs to become school mathematics leaders.

References:

Public Education Department: https://webnew.ped.state.nm.us/bureaus/licensure/endorsements-how-to-add-a-license/elementary-math-specialist/

National Council of Teachers of Mathematics: https://www.nctm.org/PtA/

Association for Mathematics Teacher Educators: https://amte.net/sites/amte.net/files/SPTM_ExecSummary.pdf

TODOS: https://www.todos-math.org/we-are-todos