# M3T: Supporting Teacher Leadership & Networked Improvement of Mathematics Education in West Virginia

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# **Background & Motivation**

West Virginia serves as a unique context as a primarily rural state in a particular regional context (Appalachia), with high rates of poverty and low rates of educational attainment, though also cultural richness and connectedness of people and place that is reflective of the region

WV ranks low in terms of teachers' sense of professional agency, control, and autonomy—key issues related to teacher attrition Lack of defined teacher leadership roles around instructional improvement, despite increased state support for such roles

The M3T Noyce Track 3 project builds on a successful approach from one WV district (Pocahontas County) giving teachers agency to define problems of mathematics teaching and learning ("what bugs you") and to direct their collective professional learning

- Leveraging the tools of improvement science and "networked improvement communities" (NIC)
- Identifying and empowering middle and high school mathematics teachers as "M3T Fellows" as a statewide NIC toward improving teaching and teacher leadership



# A Networked Improvement Community

M3T utilizes tools of improvement science to collectively unpack problem spaces, develop a working theory of improvement, identify professional learning needs, test and refine solutions, and monitor short- and long-term progress toward a shared aim:

### M3T Network Aim

More than 200 middle and high school mathematics teachers across 100 West Virginia schools will regularly engage in teacher-led and continuous networked improvement, resulting in increased opportunities to "do mathematics" for 20,000 students by 2026



problem space (e.g., "Not enough students are 'doing math' in math classrooms")



A driver diagram as a working theory of improvement and change—to connect to the problem map and to organize testing and measurement

"Plan-Do-Study-Act" (PDSA) Cycles to structure the collective testing of change ideas and the sharing of learning across the network



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## **Building a Statewide Network**





At the center of the network are middle and high school mathematics teachers who have been selected as M3T Noyce & Mountain State Fellows • Across three cohorts, we currently support 43 Fellows representing 29 county

As a statewide, research-practice partnership, the M3T network also includes participation from other education stakeholders:

- Administrators and coaches from participating schools and districts
- Project leadership and supporting faculty, researchers, and staff at WVU
- Additional teachers participating in local improvement teams led by M3T Fellows in their local schools or districts (currently more than 80 additional teachers in the 2022-2023 school year
- Staff from the West Virginia Department of Education

school districts from across the state

Through the work of this network, we are interested in building on and contributing to scholarship and practice on NICs, focusing on improvement in mathematics classrooms as well as the development of teacher leadership and agency in educational contexts

# **Project Research and Evaluation**

The M3T Noyce project research team, along with our external evaluators from WestEd, are working to pursue the following questions connected to this work:

### **Key M3T Research and Evaluation Questions**

What are M3T Fellows' perceptions of the program as it relates to the effectiveness of their own teaching, their ability to serve as teacher leaders, and their overall job satisfaction?

What are participating teachers' and administrators' perceptions of the M3T program as it relates to improving teaching and learning in their respective buildings?

How do M3T Fellows' identities as mathematics teachers and mathematics teacher leaders evolve over the course of the program?

How do systemic (school-, district-, and/or state-level) factors foster or hinder the development of a culture of mathematics teacher leadership, defined by teacher agency and voice in improvement efforts and professional development?

How do M3T Fellows and other participating teachers make sense of and make claims about student learning and instructional improvement based on data?



# **Project Outcomes and Successes To Date**

The M3T project is in its third year. Given the impacts of the COVID-19 pandemic, we are pleased to still have seen the progress of this project, particularly initiating the work, recruiting the network of Fellows, and setting the stage for the coming years.

### **Other outcomes and successes include:**

- Fellows' feedback on the project experience has been overwhelmingly positive—described as professionally valuable and a "saving grace" during a difficult period of time
- Fellows have already been active sharing their work and being given voice in school, district, and statewide settings
- Local team participants are positive about their interactions with M3T Fellows and the networked improvement approach
- Administrators report influence on mathematics instruction and on teacher leadership

"What I love about this project is that I feel like I have real ownership over the changes that I make. My team and I talk about what is bugging us, we discuss what we want to change, and then we study to see if it worked. This project is driven by the teachers and our needs." -- M3T Noyce Fellow

### Programmatic

- Resuming peer classroom visits
- Expanded interactions with other stakeholders in the network
- Continued and expanded data collection plans to inform and monitor various aspects of the network's improvement
- Developing structures to "advance" the learnings of the network through dissemination

### Research

- interviews
- Case studies of Fellows and districts
- Social network survey

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mountaineer mathematics master teachers

### @m3t\_wv

• All 18 Cohort 1 M3T Noyce Fellows and all 14 Fellows from Cohort 2 are leading local improvement teams in their school or district during the 2022-2023 school year—each with the support of and through Fellow-led interactions with district administration

## **Next Steps and Ongoing Work**

 Continued data collection and analysis to inform teacher leadership research— Fellow journaling, focus groups, and



# Acknowledgements



