Mathematics Teacher Education Partnership

Presentation to the Critical Issues in Mathematics Education Workshop, MSRI
March 27, 2014
MTE-Partnership

• Organized by the Association of Public and Land-grant Universities (APLU) as a part of its Science and Mathematics Teacher Imperative (SMTI).
MTE-Partnership Goal

To transform the preparation of secondary mathematics teachers to ensure they can promote mathematical excellence in their future students, leading to college and career readiness as described in the Common Core State Standards for Mathematics (CCSS-M).

“To set the bar for the nation in secondary mathematics teacher preparation”
MTE-Partnership Membership

- Consists of partnership teams that include:
  - An APLU/SMTI institution as the lead
  - At least one K-12 district
  - At least one other organization (e.g., collaborating university, college, or community college; regional inservice center; state department of education)

- Teams must demonstrate continuing involvement of:
  - Mathematics educators
  - Mathematicians
  - K-12 educators
38 Partnership Teams – 30 States:
- 68 universities and 9 community colleges
- 87 school systems
Networked Improvement Community (NIC) Design

The NIC design marries:

• precepts of improvement science, such as problem analysis and “Plan-Do-Study-Act” cycles, with

• precepts of networked design, so that common activities and measures can be carried out across a range of contexts in order to produce

• tested products, programs and approaches addressing important issues

• that are sensitive to conditions effecting their success.
Cycle of Prototyping, Testing, and Revision

- **Act**
  - What changes are to be made?
  - Next cycle?

- **Plan**
  - Objective
  - Predictions
  - Plan to carry out the cycle (who, what, where, when)
  - Plan for data collection

- **Study**
  - Analyse data
  - Compare results to predictions
  - Summarise what was learned

- **Do**
  - Carry out the plan
  - Document observations
  - Record data
Networked Cycles – Embracing Context

Plan
- Objective
- Predictions
- Plan to carry out the cycle (who, what, where, when)
- Plan for data collection

Do
- Carry out the plan
- Document observations
- Record data

Act
- What changes are to be made?
- Next cycle?

Study
- Analyse data
- Compare results to predictions
- Summarise what was learned

Do
- Next action
- Next step
- Next task

Plan
- Next cycle
- Next plan
- Next strategy

Act
- What change are to be made?
- Next cycle?

Study
- Analyse data
- Compare results to predictions
- Summarise what was learned

Do
- Next action
- Next step
- Next task

Plan
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Act
- What change are to be made?
- Next cycle?
Projected Outcomes

• A variety of validated products, programs and approaches addressing important issues in secondary mathematics teacher preparation

• Incorporates sensitivity to the conditions affecting their success throughout the developmental process
Driver Diagram

**Improvement Target**

*C Creating a “gold standard”
Programs document that their graduates are capable of providing the ambitious instruction and deep learning compelled by CCSSM, based on benchmarks to be developed by the MTE-Partnership

* More and better new teachers
To prepare <target number> of graduating secondary mathematics teachers with an emphasis on increasing diversity.

**Primary Drivers**

* Creating a Vision
Creating a common vision of and commitment to SMTP among stakeholders

* Clinical Preparation
Developing and supporting mentor teachers who can provide field experiences that support candidates' development of instructional practices.

* Content Knowledge
Developing candidates' knowledge of mathematics needed to support student learning of content and practices

* Recruitment and Retention
Attract and maintain an adequate supply of candidates

**Secondary Drivers**

* Math/Math Ed Collaboration
* Mentor Teachers
* Math/K-12 Connections
* Transdisciplinary Projects

* Mentoring Skills
* Accessibility
* Partnerships
* Content knowledge
* Attention to SMP

* Content of Math Courses
* Engaging Students in SMP
* Holistic View of Mathematics
* Fluency with Technology
* Assessment of Courses
* Sharing Innovations

* Awareness of Careers
* Incentives
* Time Required
* Advisement
* Relevance of Experiences
Progress of the Partnership

- **June 2011** – a small group conceived of this partnership at SMTI National Conference
- **March 2012** – *Guiding Principles for Secondary Mathematics Teacher Preparation* and first annual MTE-Partnership conference
- **June 2013** – white papers defining the problem space, leading to second annual MTE-Partnership conference
- **September 2013** – grant from Helmsley Charitable Trust to launch action phase
“Research Action Clusters” (RACs)

• Collaborations of partnership teams have been formed to address specific challenges facing secondary mathematics teacher preparation using the Networked Improvement Community model.
RACs in Progress

• Developing Effective Clinical Experiences \(\leftarrow\) Mentor professional development; alternative models

• Building Communities and Courses \(\leftarrow\) Addressing specific mathematical needs of secondary teachers (cf. METII)

• Knowledge-for-Teaching-Mathematics Tasks (KTMT) \(\leftarrow\) Assessing mathematical knowledge for teaching

• Actively Learning Mathematics \(\leftarrow\) Improving instruction in introductory mathematics classes

• MATH: Marketing for Attracting Teacher Hopefuls \(\leftarrow\) Moving beyond advertising
Continuing Work of the Partnership

- **Spring 2014:** RACs begin piloting interventions and collecting data
- **June 2014:** Third partnership conference
- **Fall 2014:** Scale-up of RAC activity
Challenges to Engaging Mathematicians

- Mathematics education may not be a priority for many mathematicians and mathematics departments.
- Reimagining courses to promote the mathematical practices that prospective teachers (cf. MTEII) – and arguably all students -- need to develop may challenge deeply held beliefs and departmental culture.
- Aspects of teacher preparation that are not directly related to content may be perceived as the province of mathematics educators.
Opportunities for Further Engagement

• Invitation for additional teams to join the Partnership – see www.x.co/mtepapp/
• SMTI Annual Conference will include a focus on the MTE-Partnership – see www.aplu.org/smti
For More Information

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• For more information
  www.MTE-Partnership.org