

Teacher preparation and professional development and their contribution to MKT

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Outline

- 1 Pre-service preparation
 - Research
 - Measures

- 2 Induction
 - Mentoring
 - Professional development

National Math Panel findings 2008

Available research is not of sufficient rigor or quality to permit conclusions about the features of professional training that impact teachers knowledge, their instructional practice, or their students achievement.

Moreover, research indicates that differences in teachers knowledge and effectiveness between the multiple pathways are small or non-significant compared to very large differences among the performance of teachers within each pathway.

Other findings

- Historical lack of high-quality measures of mathematics content knowledge, as well as a scarcity of high-quality studies using these types of measures.
- MKT proxies included certification, courses completed, and direct tests of teachers knowledge of mathematics.

Note: Ball/Hill/Bass et al, have developed instruments to measure the MKT for elementary teachers on a large scale, no large scale similar project seems to be going for secondary teachers.

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New measures of teacher effectiveness are coming soon to a state near you

- USED, RTTT, Gates-MET
- MKT, instructional practice, students understanding/growth/performance-value added

Questions:

- Valid and reliable?
- Will teacher data be linked to prep program?

Student Test Scores → Teacher Evaluation → Prep Program Assessment

- Will these prep program assessments be meaningful?
- Will the new student assessments be valid for this purpose?
- Meanwhile, how can we obtain better data on preparation program effectiveness?
Which model(s) provides the best opportunities for candidates to build their MKT and develop robust instructional practices that advance student understanding/growth/achievement.

Impact of preparation pathways and duration

- Some preparation programs are offered through Universities, some by schools/districts, some by outside organizations, and some in partnerships.
- Some teacher prep occurs in undergrad, some in 1 or 2 yr MAT programs, some in intense boot-camp workshops just before teaching, and some in 'Saturday/evening programs' after a candidate starts teaching.
- Some have strict admissions standards, some do not.
- Some pathways follow cohort model/some do not.

Impact of the practicum

- Some include robust clinical practice for a full year (aka residency model);
- Some require only 8-10 weeks of teaching practicum (traditional model);
- Some involve highly trained mentor teachers who model effective mathematics teaching and some work with untrained mentors.

Impact of the induction/mentoring

- Some preparation programs partner with local districts for high quality teacher induction using content-specific mentors for a few years after the teacher graduates and use this engagement to assess the quality/relevance of their programs;
- Some do not engage with new teacher induction at all and leave this up to schools/districts;
- Others participate, but at a minimal level (e.g., over a short time period or without well trained and content-specific mentors.)

So then

- Who has the answers?
- Who cares?
- Who should lead investigation?
 - The prep program?
 - School/district/state DoE/USED?
 - Professional organizations (eg., AACTE, NCATE, AMTE, NCTM, MAA,)?
 - Other organizations like NCTQ, Gates,?

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Our approach

Our students

- have lower load
- are present from day 1 to day 180
- participate as a teaching assistant first semester
- teach fully with the mentor teacher as a teaching assistant

Some conversations: Mentor Fellow

experiment with different phrases to start the day. very common: "today we're going to learn about"

experiment with:

a) Racquel, you're a nice kid, so i'm giving you a garden. it happens to be a triangular garden, and we need to figure out the best place to put a sprinkler...

...when working through a problem ... do I need to draw the multiplication box whenever I multiply two binomials? when simplifying a radical, do I need to write out all the factors ...? These are things that I honestly never thought to consider before but now find to have great influence on how the class runs.

Question 1

- How does the intensive mentoring that fellows receive during their student teaching year impact their MKT?
- What is impacted most: specialized content knowledge, knowledge of content and students, knowledge of content and teaching?

Some conversations: Fellows

I continually marvel at the detail of your discussions and thoughts on how to make the concepts clear to students. You not only plan the activities, toolbox and examples but also you take time to discuss how you will develop the conversation. It makes me realize how many things I use in explanations without ever considering how to make them more clear.

... it is hard to be enthusiastic when you do not believe in the efficacy of what is being taught. It feels like all we ever teach is vocabulary and the only problems the students do just test their knowledge of definitions (an angle supplementary to 100 is equal to $5x$, solve for x). I have found inspiration in the activities Cami brings to class...

Question 2

How does the interaction with mentor teachers influence novice teachers' planning practices and their view of the curriculum?

Approaches to Professional Development

- M.S. programs
- Summer immersion workshop
- Monthly problem solving session
- Once a semester day long workshops

Question 3

- How does the continual professional development influence the novice teachers' views of mathematics?
- How do the needs for professional development change as the novice teachers gain more experience?

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- Why do we need to know?
- How do we find out what it is?

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