Learning to Teach Something in Particular:

A Common Core for the Training of Teachers

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The Mathematical Education of Teachers

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Three headlines:

1. The Common Core, the new INTASC standards, and interest in teachers' clinical education are significant **resources** for the improvement of teacher education.
2. To realize the potential of the Common Core, we will need to rebuild the **curriculum for learning to teach** fundamentally, including designing new approaches to training and new assessments.
3. We will also need to build the **capability of teacher educators** to teach that curriculum effectively.

Standards for plumbing

- Install copper and copper alloy piping
- Build a plumbing trap
- Vent a sanitary drainage system
- Disassemble and rebuild a centrifugal compressor
- Maintain joints, connections, supports, and hangars
- Install and maintain storm drainage systems

Plumbing training and assessment

- Clear, detailed performance expectations
- 5 year apprenticeship
- 1700-2000 hours on-the-job training
- 246 hours related classroom instruction
- 1-year probationary period with on-the-job evaluations

Standards for medical practice

- e.g., Conduct a chest examination:
  - Observe respiratory efforts and note presence/absence of respiratory distress
  - Confirm midline tracheal position with gentle palpation anteriorally
  - Percuss the chest on left and right
  - Ascultate the chest using using the diaphragm of the stethoscope on both right and left sides

Physician training and assessment

No equivalent in teaching

- Objectives for coursework, student teaching, and other clinical experiences are imprecise and vague and vary significantly from one program to the next
- Students of teaching rarely probe and practice the work of teaching specific content in much depth
- Performance expectations for graduates of teacher education are underspecified and weakly assessed

Vague standards

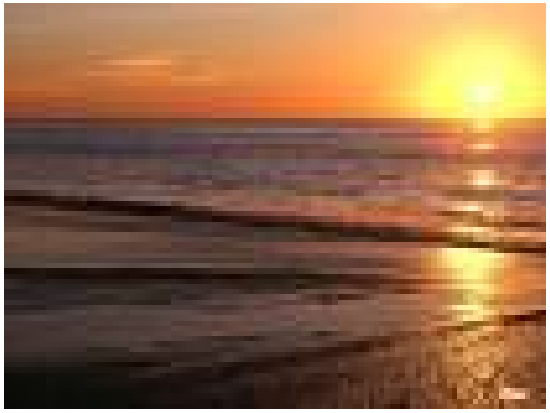
- *"The teacher uses a variety of instructional strategies to engage students in challenging academic content."*

- **rather than**
- *"The teacher elicits solutions to a geometry task and conducts a discussion comparing the solutions."*
- **or**
- *"The teacher poses a focused task to engage students in considering how to apply the definition of a fraction."*

Alternative systems: France, Finland, Singapore

- Common K-12 curricula and criterion-referenced exams
- Prospective teachers study the common curriculum in detail and practice how to teach it
- Inspection system evaluates teachers' instructional capability in reference to the common curriculum

The dawn of a new day in the U.S.?



- Common Core State Standards
- Widespread agreement that teachers matter
- Major shift: teaching can – – and *must* be — taught

Problems in designing practice-based teacher education

1. Developing a common and sufficiently precise language for the work of teaching (Grossman, et al..)
   - Teaching practice has not been decomposed into practically-sensible parts
   - Lack of useful terms for the parts, and where there is language, it is often not shared
2. Articulating teaching practices at a useful grain size
3. Managing the specific versus general aspects of teaching proficiency
   - Subject-specific versus generic
   - Local and contextualized versus general
4. Distinguishing the highly predictable and routine ("textbook cases") from the uncertain and highly complex
5. Determining what is worth trying to teach about practice, and when
   - What is of most risk to students when beginners lack skill
   - What can — or must — be learned over time

Identifying high-leverage practices (HLPs)

At Michigan, we have tried to manage three (#1, 2, and 5) of these problems by:

- Enlisting the experience and imagination of a broad range of practitioners and researchers to create a comprehensive “map” of the work of teaching
- Specifying and using criteria for identifying those aspects of the work that are the most “high-leverage” for beginners
- Deliberately choosing tasks and activities at grain sizes useful for a curriculum of learning to teach

High-leverage practices and high-leverage content

- High-leverage practices are instructional tasks and activities that powerfully promote student learning and are fundamental to competent beginning teaching.

- High-leverage content is those topics, practices, ideas, and texts that are foundational to the K-12 curriculum, including the Common Core, and essential for beginning teachers to understand and be able to teach.

Examples of high-leverage practices

- Explaining specific content ideas and processes
- Choosing and using representations, examples, and models of core content
- Setting up and managing small-group work
- Recognizing and identifying common patterns of student thinking in a content domain
- Selecting and using specific methods to assess students' learning on an on-going basis
- Conducting a meeting with a parent or caregiver

Examples of high-leverage content for elementary math teachers

- Place value
- Computational procedures with whole numbers and decimals
- Fractions
- Model mathematical ideas
- Reasoning
- Construct viable mathematical arguments and critique the arguments of others

Teaching practice

The idea of “practice” in learning to teach is not new

- Teachers cite experience as most important source of learning (Jackson, Lortie)
- Student teaching (or “practice teaching”) long a key component of teacher education
- Most programs include substantial practicum or field experience

Building an explicit approach to the teaching of practice

- Beyond the equivalent of “seat time”
- Differentiating the long-held faith in “experience” and “practice” to build a curriculum for learning practice

Core components of practice-centered teacher education

- **Curriculum**: What is there to learn in order to become a competent beginning teacher?
- **Instructional activities and settings**: What specific approaches and settings work best to prepare and support novices as they *do* the complex relational, psychological, social, and intellectual work of teaching?
- **Assessment**: How do we know when beginning teachers are ready to take responsibility for their own classrooms?

An assessment *system*

- Tapping multiple aspects of practice
- Warranted by logic, connection to student growth, wisdom of practice, research
- Linked to student learning gains
- Geared to specific K-12 curriculum (CCSS)
- Offering useful information for improvement
- Connected to an ongoing R&D agenda to adjust and improve metrics
- Including detailed articulations of effective and less effective practice as well as video exemplars, to support learning

Assessing practice

Practice to be assessed	Mode of assessment	Details
Diagnosing common patterns of student thinking in computational procedures with decimals	Online, in response to video clips or written student work	Candidate will evaluate student productions, identify the common pattern or error and next steps
Eliciting and probing student thinking about adding mixed fractions	“Standardized” student	Candidate will interview a “standardized” student who responds according to script
Conducting a whole-class discussion of a problem with multiple solutions	Live classroom episode in response to prompt; live or remote observation	Candidate will be given a short period of time in which to design and enact instruction in response to a specific prompt

THANK YOU!

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Slides will be posted on
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