TEACHER PREPARATION AND DEVELOPMENT IN THE U.S.
Critical Issues and Perspectives

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TEACHER PREPARATION IN THE U.S.

Characteristics and Critical Issues

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Philadelphia, Pennsylvania, USA
OVERALL SIZE

- U.S. Population = 324 Million
- K - 12 students = 50 M
- Public school teachers = 3.6 M
- Math/science 7-12 teachers = .5 M

TURNOVER

- Strong patterns of turnover/movement (esp. math/sci.)
  - 33,000 left after 2008 school year (10K retired)
- Primary factors for math teachers: lack of autonomy, weak PD, student discipline, along with other career options

Ingersoll, 2011
States certify teachers:
• They determine certification requirements
• Approve institutions that prepare teachers

Across and within states, substantial variation exists in:
• Degree (bachelors, masters, cert only)
• Length of program (1-5 years)
• Program requirements (pre-reqs, courses, field)
• Preparing institution (IHE or other)
Demographic Issues

• U.S. teachers
  – Race/ethnicity (16.5% minority groups)
  – Within 50 miles from home

• K-12 students
  – Race/ethnicity (41% minority groups)
  – Language (10% ELL)

Data: 2011
Critical Issue: Who Teaches

Percentage Increase/Decrease in Students and Teachers, by Race/Ethnicity, 1988-2008

- All: 19 students, 48 teachers
- White: 19 students, 41 teachers
- Minority: 73 students, 96 teachers

Ingersoll & May, 2011
Measuring qualification
• Recommended by program
• Written state content tests (PRAXIS)
• Performance assessment (edTPA)
• Student test scores
TEACHER DEVELOPMENT

Issues Related to Ongoing Teacher Development

Mary Kay Stein
Learning Research & Development Center
University of Pittsburgh
TEACHING PRACTICE: Defining Our Vision

Cohen, Raudenbush, & Ball (2003); Lampert (2001); Lee (2007).
TEACHING PRACTICE: Achieving Our Vision

- It is ambitious
- Majority of American teachers’ instruction does not align with this vision
- 1 to 5 years of pre-service training is not adequate for achieving the vision
- Ideally, the role of professional development is to support teacher learning toward this vision
MODAL PD OPPORTUNITIES

- District half-day or full-day workshops
- Summer and weekend workshops
- Masters’ courses
- Join professional organizations (NCTM)
- Informal interactions with colleagues in school

- A patchwork of opportunities—formal and informal, mandatory and voluntary, serendipitous and planned—stitched together into a fragmented and incoherent "curriculum" (Ball & Cohen as cited in Wilson & Berne, 1999).

- Teacher learning is additive, not transformative
### WORKING TOWARD A COHERENT SYSTEM OF PD

<table>
<thead>
<tr>
<th>From . . .</th>
<th>Toward . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small, “boutique” programs</td>
<td>PD at Scale</td>
</tr>
<tr>
<td>Teachers as Individuals</td>
<td>Communities of teachers</td>
</tr>
<tr>
<td>One-shot workshops</td>
<td>Ongoing training</td>
</tr>
<tr>
<td>“Passive” teacher learning</td>
<td>“Active” teacher learning</td>
</tr>
<tr>
<td>Theory-based</td>
<td>Practice-based</td>
</tr>
</tbody>
</table>
**ISSUES**

- **Lack of transfer to classroom teaching**
  - Teachers teach as they have been taught
  - Well-intended teachers implement in superficial ways

- **Teachers are not held accountable for applying what is learned in PD**
  - Tradition of individualism in teaching
  - PD providers have no administrative authority
ISSUES, continued

- Lack of qualified individuals for spreading good models
  - Coaches lack expertise to deliver high-quality coaching or PD
  - Principles ill-equipped to guide and support ongoing learning

- Misalignments
  - Teaching practices promoted in PD do not align with high-stakes assessment
  - Teaching practices promoted in PD do not align with teacher evaluation systems
Large-scale studies most often examine the impact of PD on student learning without documenting its impact on classroom instruction.

Small-scale qualitative studies often employ pre-/post- measures without adequate controls and are silent with respect to issues of scale.
TEACHER EDUCATION

The Case of the University of Minnesota

Jenny Marshall
7th Grade Math Teacher
Farmington, Minnesota
STRUCTURE: *five year program*
STRUCTURE: *five year program*

University of Minnesota

UNDERGRADUATE DEGREE

TEACHER LICENSURE/MASTERS

University of Eastern Finland
**Years 1 to 4:** Undergraduate Degree

*master content knowledge*

- English
- Geography
- Math
- Chemistry
- Biology
STRUCTURE: five year program

Year 5: Teacher Licensure

- Education foundation courses

- Special Needs
- English Learners
- Technology
- Reading in Content Area
- Child Psychology
- Learning & Assessment
**Year 5:** Teacher Licensure

- Education foundation courses
- Mathematics pedagogy courses

Arithmetic  
Algebra (taught in a school)  
Geometry
Year 5: Teacher Licensure

- Education foundation courses
- Mathematics pedagogy courses
- Teaching practicum
**Year 5: Teacher Licensure**

- Education foundation courses
- Mathematics pedagogy courses
- Teaching practicum
- Teacher Performance Assessment (EdTPA)
Year 6 and beyond: Finish M.Ed. Degree

- Four more courses
Year 6 and beyond: Finish M.Ed. Degree

- Four more courses
- Directed studies
**Reflection: Pros and Cons**

**Helpful:**
- Nice blend of math content, pedagogy, and practical experience
- Opportunity to stay connected with university after getting teaching experience

**Challenging:**
- Significant differences in teaching strategies and beliefs among colleagues due to inconsistencies in educational experiences
MATHEMATICS EDUCATION

Roles of Mathematicians in Mathematics Education

Hyman Bass
University of Michigan
Department of Mathematics & School of Education
Cohen, Raudenbush, & Ball (2003); Lampert (2001); Lee (2007).

Teaching is what is co-produced by students and teachers in contexts, around specific content and curriculum.

Where are mathematicians’ concerns located in this picture?
The curriculum materials (standards, textbooks, assessments) should be mathematically correct, rigorous, comprehensive, and ambitious. Mathematicians rarely witness K-12 teaching, so curriculum is what they mainly react to.

Accordingly, they feel that mathematicians have a vital role to play in the production of curriculum materials.

History: New Math; NCTM Reforms; Common Core
The curriculum materials express the learning goals for students.

Teachers need a deeper and broader knowledge of what the children are meant to learn. This is best achieved by teachers taking more, and more advanced mathematics courses.

Note that the arrows are no longer bi-directional.
WHAT IS MISSING?

- **Pedagogy** (including PCK & MKT)

- **Student thinking** – both what it is like, and how to integrate that into instruction. (Teachers teach math, and they teach children.)

- **Respect** for teachers, and the teaching profession

- And attention to the items above is often also absent in their own university level instruction
Mathematicians lament the weak mathematical knowledge of many school mathematics teachers.

Yet these teachers learn much of their mathematics in math department courses taught by these mathematicians.

The boundary between pedagogy and content is becoming less sharp, and so better coordination between math departments and schools of education is important.

It is hard for faculty well prepared for such cross-boundary instruction to gain status in math departments.
Thank You

KIITOS