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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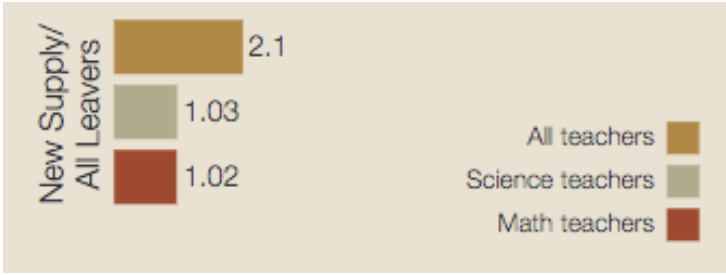
Characteristics: Size and Turnover

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



Ingersoll, 2011

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

Characteristics: Variation

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)

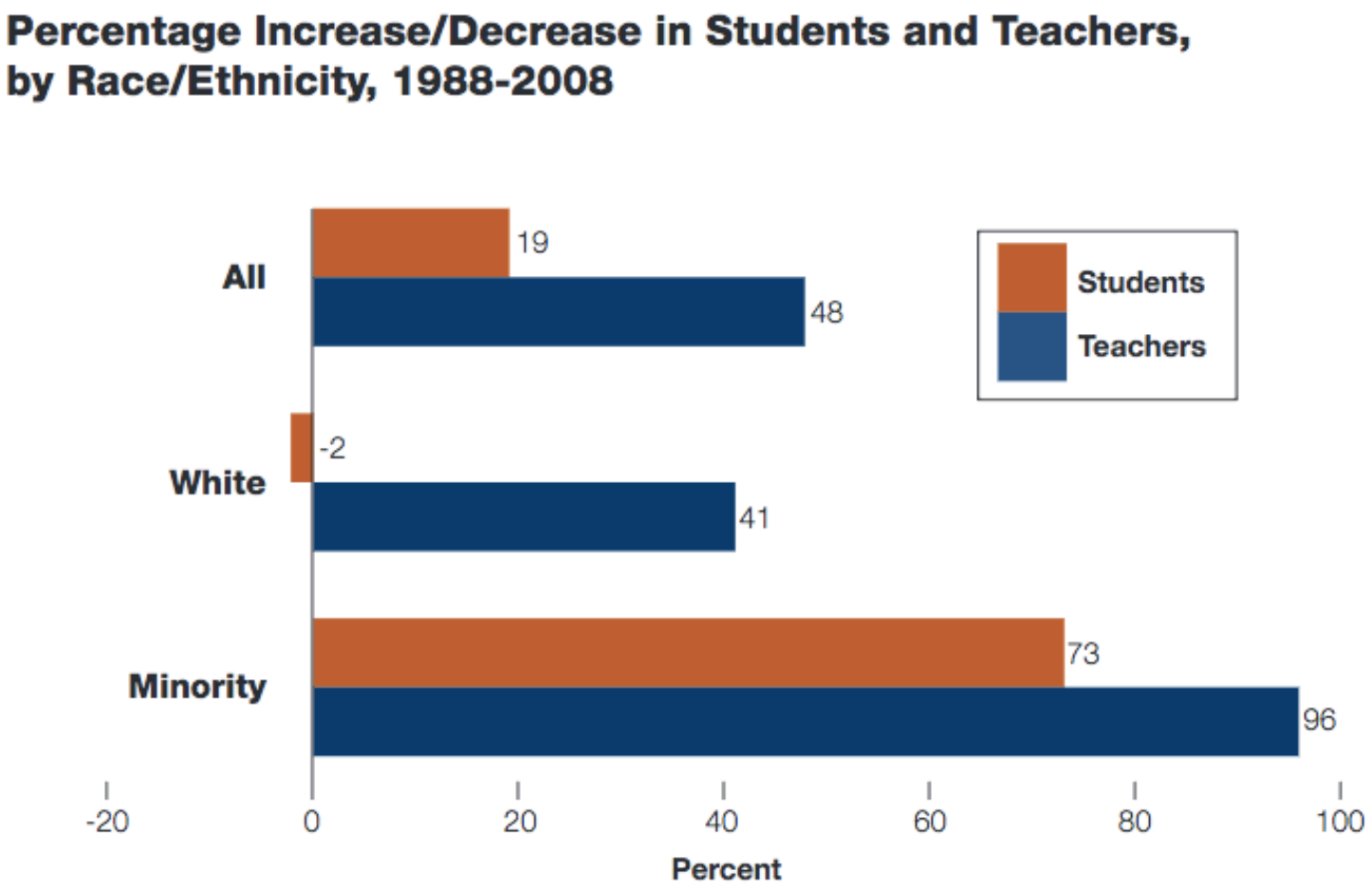
Critical Issue: Who Teaches

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



Ingersoll & May, 2011

Critical Issue: Who Teaches

Measuring qualification

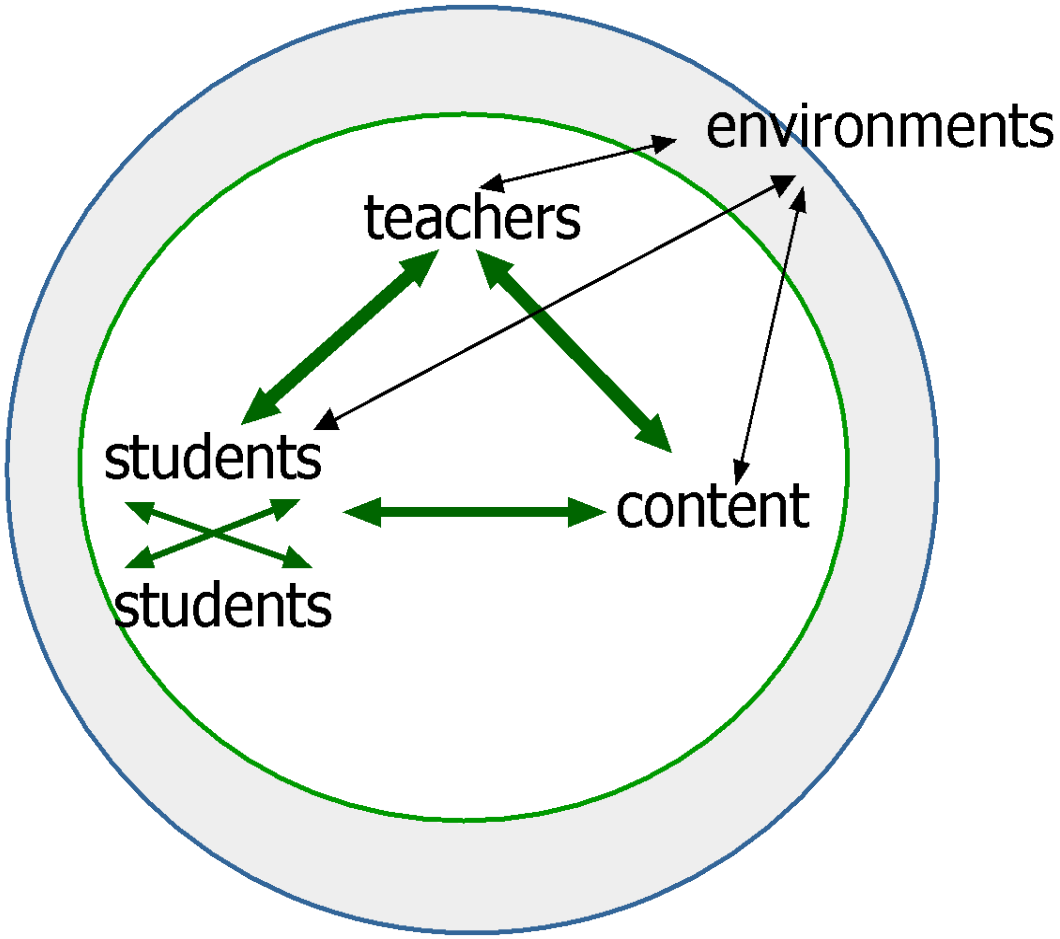
- Recommended by program
- Written state content tests (PRAXIS)
- Performance assessment (edTPA)
- Student test scores

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

From . . .	*Toward . . .*
Small, “boutique” programs	PD at Scale
Teachers as Individuals	Communities of teachers
One-shot workshops	Ongoing training
“Passive” teacher learning	“Active” teacher learning
Theory-based	Practice-based

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

PROFESSIONAL DEVELOPMENT: *Research*

- 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*

UNIVERSITY OF MINNESOTA

UNDERGRADUATE DEGREE | TEACHER LICENSURE/MASTERS

STRUCTURE: *five year program*

UNIVERSITY OF MINNESOTA

UNIVERSITY OF
EASTERN FINLAND

STRUCTURE: *five year program*

Years 1 to 4: Undergraduate Degree

master content knowledge

ENGLISH

GEOGRAPHY

MATH

CHEMISTRY

BIOLOGY

UNDERGRADUATE DEGREE

TEACHER LICENSURE/MASTERS

STRUCTURE: *five year program*

Year 5: Teacher Licensure

- Education foundation courses

Special Needs

English Learners

Technology

Reading in Content Area

Child Psychology

Learning & Assessment

UNDERGRADUATE DEGREE

TEACHER LICENSURE/MASTERS

STRUCTURE: *five year program*

Year 5: Teacher Licensure

- Education foundation courses
- Mathematics pedagogy courses

Arithmetic

Algebra
(taught in a school)

Geometry

STRUCTURE: *five year program*

Year 5: Teacher Licensure

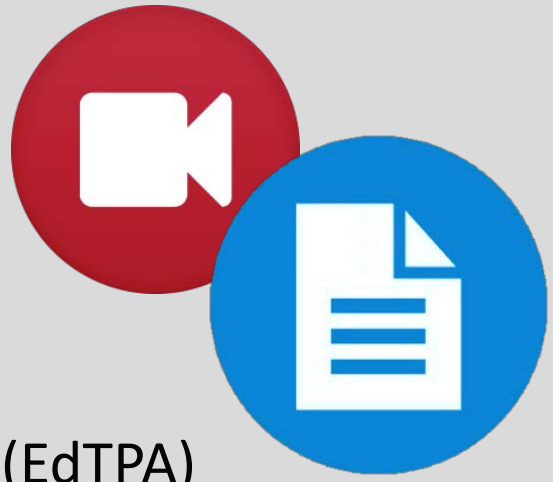
- Education foundation courses
- Mathematics pedagogy courses
- Teaching practicum

UNDERGRADUATE DEGREE | TEACHER LICENSURE/MASTERS

STRUCTURE: *five year program*

Year 5: Teacher Licensure

- Education foundation courses
- Mathematics pedagogy courses
- Teaching practicum
- Teacher Performance Assessment (EdTPA)



UNDERGRADUATE DEGREE | TEACHER LICENSURE/MASTERS

STRUCTURE: *five year program*

Year 6 and beyond: Finish M.Ed. Degree

- Four more courses

STRUCTURE: *five year program*

Year 6 and beyond: Finish M.Ed. Degree

- Four more courses
- Directed studies

UNDERGRADUATE DEGREE | TEACHER LICENSURE/MASTERS

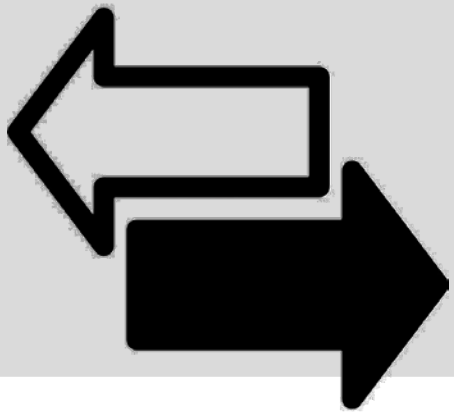
REFLECTION: *pros and cons*

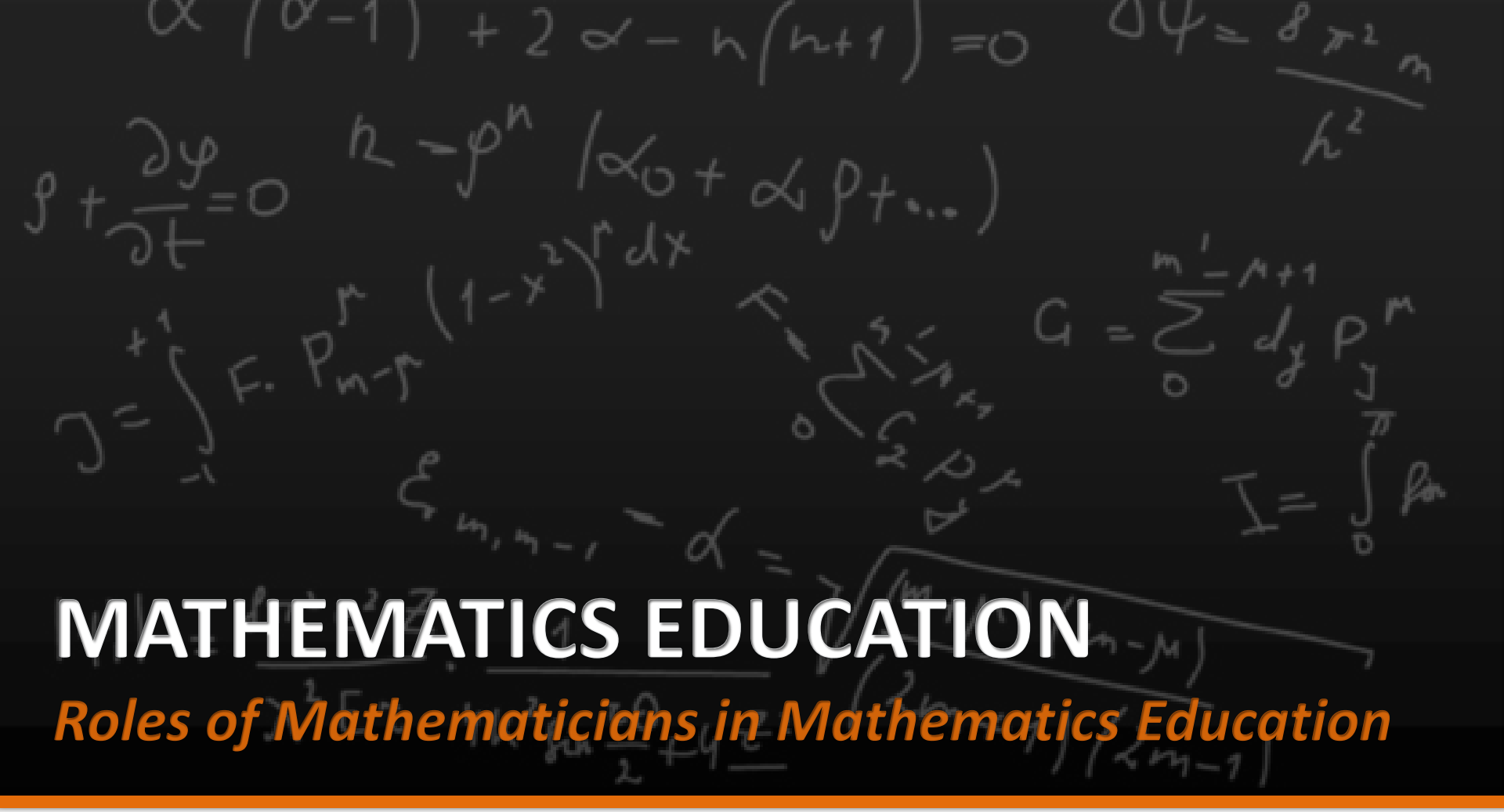
Helpful:

- 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

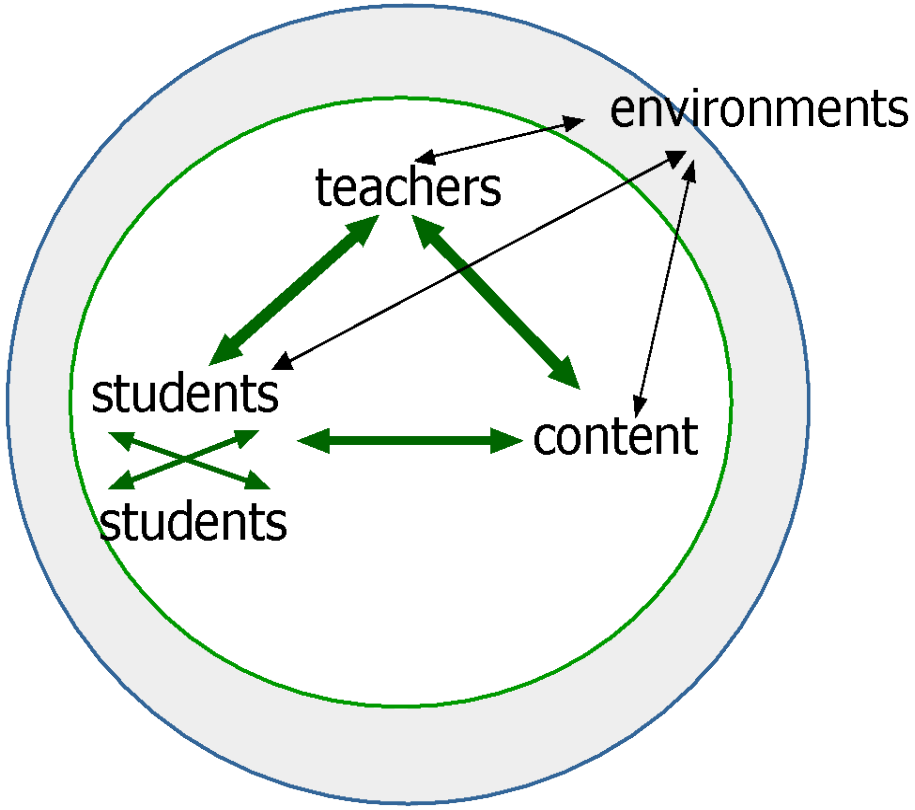
Roles of Mathematicians in Mathematics Education

Hyman Bass

University of Michigan

Department of Mathematics & School of Education

THE "INSTRUCTIONAL TRIANGLE"



Cohen, Raudenbush, & Ball (2003); Lampert (2001); Lee (2007).

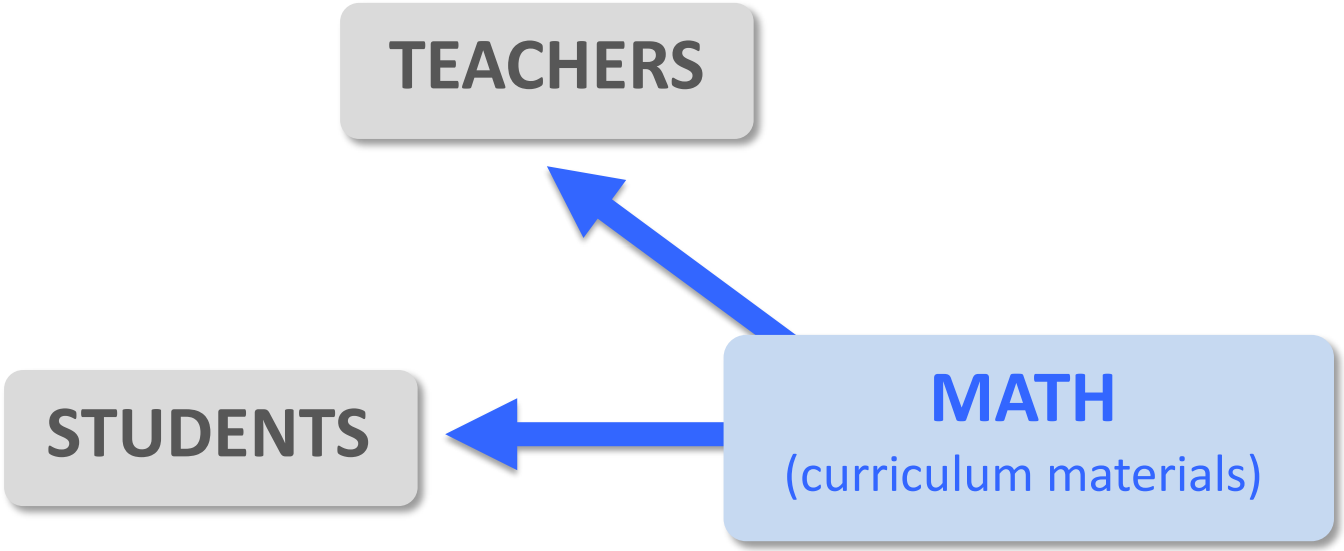
- Teaching is what is co-produced by students and teachers in contexts, around specific content and curriculum
- Where are mathematicians' concerns located in this picture?

MATHEMATICIANS PERSPECTIVE & FOCUS

MATH
(curriculum materials)

- 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

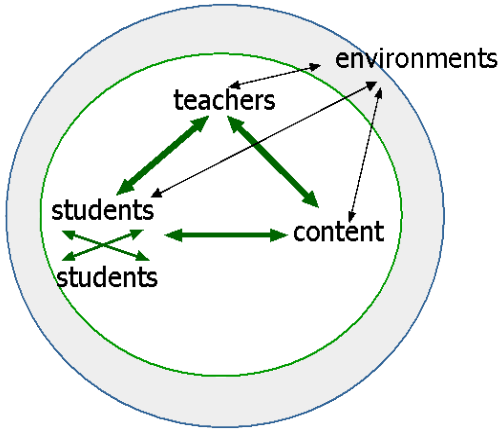
MATHEMATICIANS PERSPECTIVE:
Implications for Instruction



- 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**

RELATION OF MATHEMATICS DEPARTMENTS TO SCHOOLS OF EDUCATION: Major Problem in U.S.

- 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