Preparing and Retaining Teachers in Urban Schools using Research Lessons

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Great Teachers for our City Schools Summit

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Our Agenda for Today

- Conceptual underpinnings of our work
- The Story of Kyle
- Some preliminary observations and claims
- Discussion

Initial Comments

Pre-service teacher preparation is early career professional development, so programs should possess the features of good professional development:

- Content centered
- School based
- Collaborative
- Linked to curricula
- Focused on student learning (Smith, 2001)

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Initial Comments

It is unrealistic to expect students to emerge from pre-service programs with knowledge and skills needed to be a competent 1st year teacher

- Teaching is enormously complex
- 1st year teachers have same job as 10th and 20th year teachers

Initial Comments

Instead, programs can focus on pointing the "teacher learning trajectory" in a productive direction, by helping prospective teachers to learn how to

- Learn mathematics for (from) teaching
- Learn to teach

"[P]reparation programs can be more effective by focusing on helping students acquire the tools they will need to learn to teach rather than the finished competencies of effective teaching" (Hiebert, et al. 2003, p. 202).

Goal: A *Professional* Teaching Culture

- Collaborative, rather than isolated and private
- Oriented to solving the problems of practice (Lampert, 2001)
- Built on a knowledge base that is
  - Public
  - Accessible and cumulative
  - Continually verified and improved (Hiebert, et al., 2002)

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Conceptual Underpinnings

- Learning, and in particular, *teacher* learning, is *situated*

  Learning to teach as participation in the variety of communities of teaching practice through which teachers move during their school experiences

  (Adler, 2000; Greeno & MMAP, 1998; Lave & Wenger, 1998)

- What teachers learn: Domains of professional expertise
  - Mathematics knowledge for teaching
  - Mathematics-specific pedagogical knowledge
  - Professional identity: sense of self as teacher

  (Peressini, Borko, Romagnano, Knuth & Willis, 2004)

- Where teachers learn: The lesson as unit of analysis

  "The individual lesson is a big enough unit of teaching to contain all of the complex classroom interactions that influence the nature of learning opportunities for students. At the same time, the individual lesson is the smallest natural unit for teachers that retains such interactions" (Hiebert, et al., 2003)

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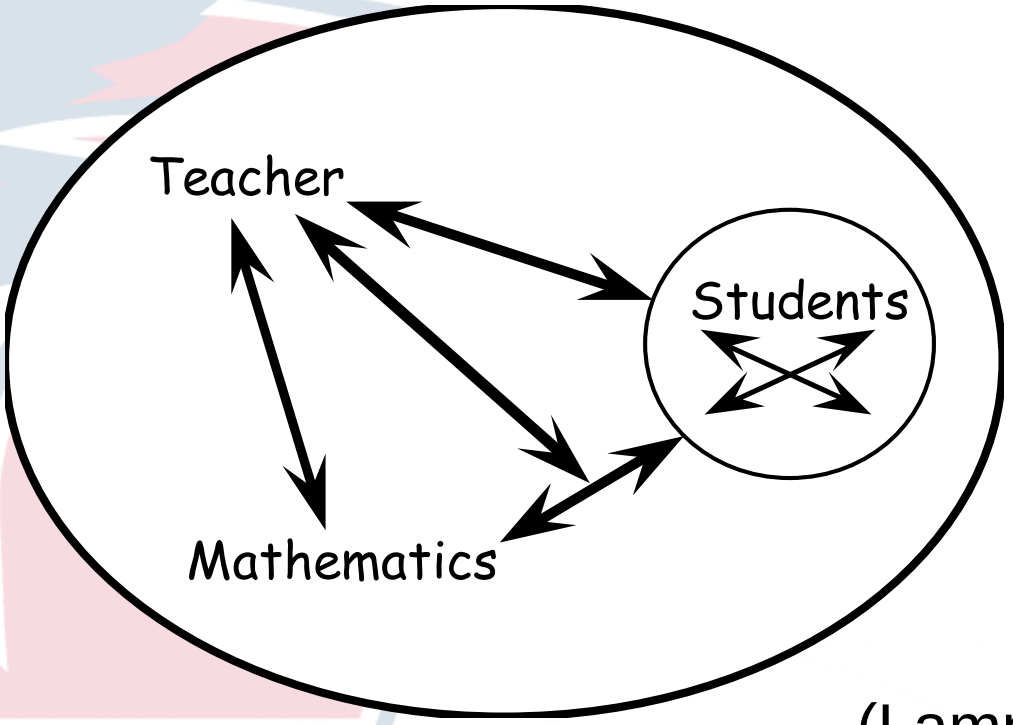
The Lesson as Experiment

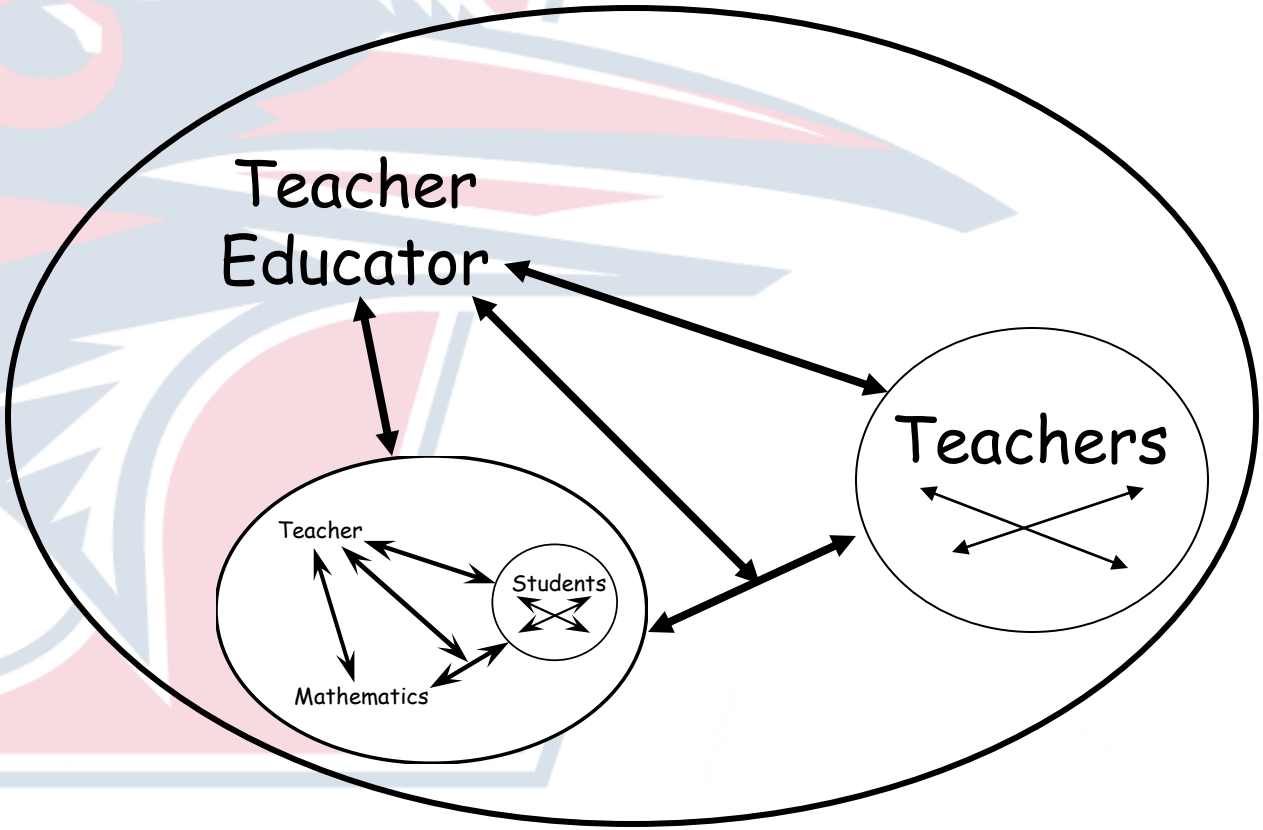
- "[Lesson] plans are local theories of teaching and learning with the planned lesson serving as an example" (Hiebert, et al., 2003)
- Planning includes:
  - Making hypotheses about students' learning trajectories
  - *Testing* hypotheses by gathering data on students' thinking
- Analysis focuses on effects of specific teaching interactions on student learning

A Model of Teaching Practice



(Lampert, 2001)

Studying Teaching Practice



Japanese Lesson Study*

Working as a team, teachers

- Identify a problem or an issue
- Set goals
- Plan the lesson
- Teach and observe it
- De-brief and revise
- Report publicly

* Fernandez & Yoshida (2004)

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Planning the Research Lesson

- Overarching Goals
- Curriculum, unit, lesson goals
- "Content analysis"
  - What we usually call "content," and
  - Students as learners of this content
  - *Learning* goals

Collaboration by the teachers in the lesson study group is needed to accomplish this extended study of content

Other Important Features

- Research Lesson
  - Multiple perspectives on same real-time events
  - Specific instances of general principles
- Post-lesson de-brief
  - Facilitator
  - Outside observer (“knowledgeable other”)
- Revision
- Reports
  - Research lesson
  - Lesson Study

The Value of *Sustained* Planning

- Builds teachers' content knowledge through deep, focused study of:
  - Content
  - Curriculum
  - Students as learners
- Makes explicit connections to goals
- Focuses attention on *intention* in teaching

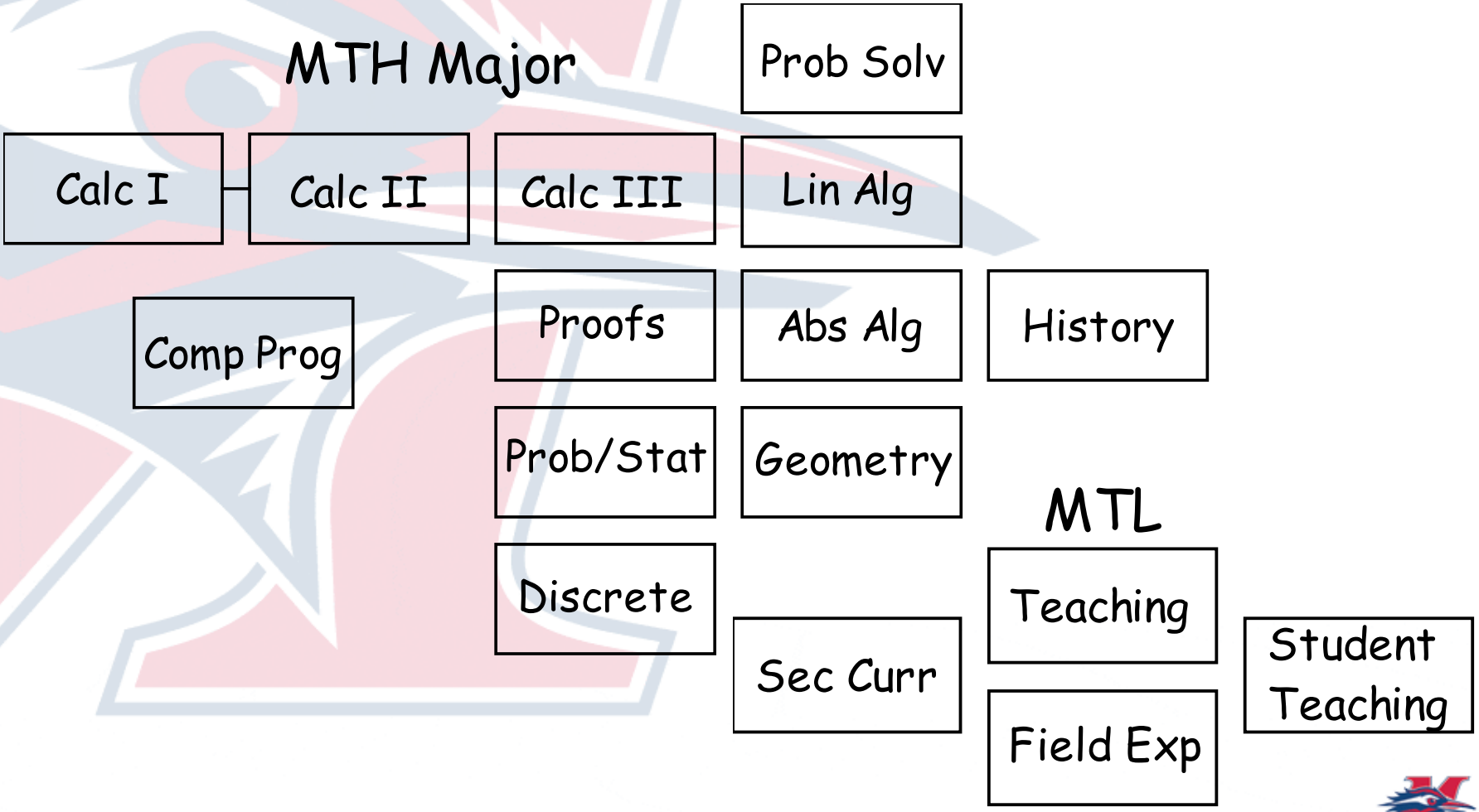
Some Benefits of Lesson Study

- *Professional* development, not simply lesson development
- Focus on *teaching*, not on the teacher
- Builds capacity to see and hear the mathematics in students' work
- Develops a language of teaching
- Slow but steady, long-term, collaborative change

Meet Kyle

- Mathematics major with minor in secondary ed
- Spring 2008: “Teaching Secondary Mathematics”
  - 2 research lessons in MFET
  - 1 research lesson in field experience
- Fall 2008: “Mathematics Student Teaching”
  - Co-led 2 research lessons
  - Participated in 2 research lessons at another S-T site

Structure of Our Program



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Program Framework

Content Analysis

- Understanding the problem

  What are the solutions, and why?

- Mathematics content

  What are the underlying big mathematical ideas? Where in the discipline? In the curriculum?

- Students' thinking and learning

  Anticipated student responses? Ways students come to understand this content? Difficulties students have with this content?

Program Framework

Lesson Analysis

- Lesson as experiment

  A collection of conjectures – about the effects of specific instructional actions on students' learning of particular mathematical ideas – that can be tested by collecting evidence of student learning during the lesson (Hiebert, et al., 2003)

- A Key Features Lens

  The nature of classroom tasks; the role of the teacher; the social culture of the classroom; mathematical tools as learning supports; and equity and accessibility (Hiebert, et al., 1997)

Lesson Analysis Contexts

- Design, teach and observe, analyze, revise and re-teach a lesson in mathematics for elementary teachers;
- Study lessons captured on videotape;
- Participate as students and observers in lessons taught by the “methods” course instructor;
- Participate—as members of a team that includes the course instructor and their mentor teachers—in planning, teaching and analyzing two lessons in their field experience classroom.

Lesson Analysis

- *All* Lesson plans are taught and de-briefed
- Lessons built around rich mathematical problems

  "The lesson must be designed so that students' thinking is revealed across multiple strands of mathematical proficiency. A natural way in which this can occur is by centering the lesson on solving significant mathematical problems and then listening to students discuss methods that can be used to solve the problems (Chazan, 2000; Lampert, 2001)." (p.210)
- *All* work is collaborative

Research Lessons in “Teaching Secondary Mathematics”

- The methods instructor taught a lesson built around a problem from the curriculum of our first MFET course, a problem-based course
- The entire methods class then de-briefed this lesson and planned a lesson on on it for an MFET class
- The lesson was taught by two of the students, debriefed, revised and re-taught by other students in other sections of the MFET course

[Kyle and his class did this twice]

- The students, who were placed in groups for their field experience, then worked with their cooperating teachers, the methods instructor, and other MTL faculty, to plan, teach, de-brief, revise, re-teach and write a report of a research lesson in their field experience classes

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Research Lessons in Student Teaching

- Kyle was placed, with Megan, at a middle school with mentor teachers Lisa and Jaimie
- Kyle, Megan, Lisa, Jaime, Julie (the College Supervisor), Josh (a student teacher placed at another middle school), and Lew (an MTL faculty member), planned 2 research lessons
- Kyle and Megan were the teachers for both lessons. Other MTL faculty members participated as “outside observers” for the lessons and de-briefs
- Kyle and Megan participated in the planning, observation and de-briefing of the 2 research lessons conducted by Josh and his team at his placement

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Student Teaching Research Lesson #1

- Planned for 2 weeks, including one formal planning meeting, by the team: Kyle, Megan, Lisa, Jaimie, Julie, Josh and Lew
- Taught by Kyle and Megan; observed and de-briefed by the team plus Don and Jim (MTL faculty members)
- 8th grade algebra lesson (*CPM* curriculum)
  - The lesson's mathematical focus was on linear functions and their representations (size of 15% tip as a function of check amount)
  - The team's research focus was on learning more about selecting and orchestrating a rich task
- We'll see a brief excerpt from an hour-long de-brief

“Give them a chance to gnaw on the question…”

Check	Tip
10	1.50
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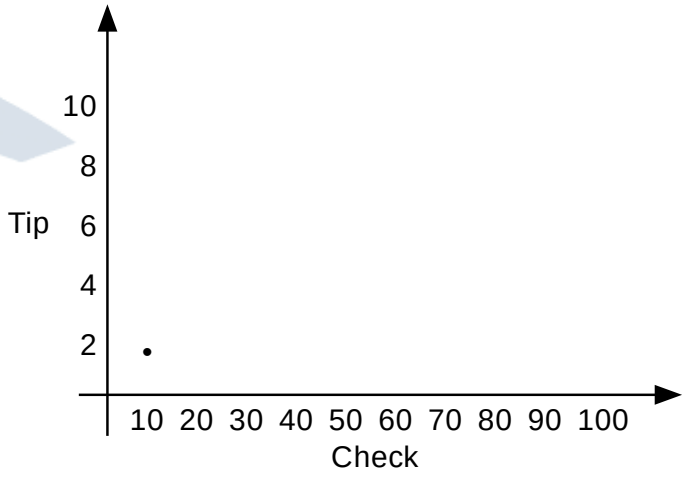
are needed to see this picture.



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Some Initial Findings

- The focus for an extended time on single lessons slowed down the whirlwind of teaching and provided a structure so our student teachers could think about and analyze it
- The first student teaching research lesson changed the nature of interactions between student teachers and their mentors
- Student teachers got better over time at posing research problems and planning lessons
- Planning *meetings* played a critical role
- Paired placements forced student teachers to plan explicitly every day, and gave student teachers an “equal” to talk to every day

Some Initial Findings

- Having two mentor teachers rather than one seemed to be less important, as long as they (the mentors) were willing to engage in the process
- The Fall 2008 student teachers were particularly articulate about what they needed to learn more about, such as:
  - how to use students' ideas
  - how to allow students to struggle
  - how to establish one's own classroom
- MTL faculty team involvement in the process, in a non-evaluative role, said that we take this seriously
- MTL faculty involvement gave us lots of feedback on the influence of our program on our students

“Using students’ ideas to improve the teaching”

“Letting students make their mistakes”

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Without a professional discourse about classroom practice, education is in a weak position to improve itself.*

* Lampert, M. (2001). *Teaching Problems and the Problems of Teaching.* New Haven, CT: Yale University Press (p. 30).

Discussion

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Learning opportunities for the field

1. What do prospective teachers learn about teaching practice from a collaborative approach to lesson analysis? In particular,
   - (a) In what ways do prospective teachers talk about teaching practice, and how does this language develop AND CHANGE over time?
   - (b) How does prospective teachers' focus on student thinking and learning evolve over time?
2. What are the DYNAMICS of collaborative work among MSCD students and mentor teachers in student teaching?

Questions

- Preservice students participate as students in lessons taught by the course instructor, and then unpack these lessons from the perspective of a teacher
- Preservice students have trouble transferring what is possible with “them” to what is possible with secondary students.
- How do you help students make this transition?

Questions

- What content important in preparing to transition from a student to a teacher do you sacrifice in focusing on the research lesson?
- Questions of scale
- Who is the “outside expert?” Who serves as facilitator? How do they “learn” to enact these roles? What learnings are you finding from this work that could inform others about each of these roles?

Questions

- Raised issue of time - how are the teachers freed up to design the lesson with the team? Time to design the lessons - both in class and in the field?