Role of the Teacher in Large-Scale Urban Mathematics Curriculum Reform

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Implied mechanism for impact of curriculum as a set of materials

- If curriculum is viewed as a set of materials for teachers and students, there are ways to define what the materials are/represent, and therefore how they impact student learning
  - Collection of tasks, examples and explanations, carefully sequenced to be taught in a particular order
  - Collection of tasks, examples and explanations, to be chosen from at the teachers’ discretion
  - Descriptions of a plan for instruction and a set of tasks, examples, and explanations that can/must be used to execute that plan for instruction
Fidelity of Implementation

• Measure of how well the implementation matches the intended intervention (Fullan, 2007)
  – Implication is that teachers work as technicians, implementing the author’s vision in his or her classroom

• Urban school policy makers create policies to enforce fidelity of implementation
  – Curriculum-based professional development
  – Curriculum pacing guides

• Works against other policy reforms attempting to professionalize the teaching profession
Primary Concerns

- When did implementing a particular curriculum become a proxy for effective instruction? (c.f., Tarr, et al., 2008)
- What matters for student learning – effective instruction or implementation expertise? Are these the same
- Given the existing research that usually finds minimal effect or interaction effects for particular curriculum use, what should urban district policymakers do to improve mathematics learning?
Usability as an Alternative to Efficacy/Effectiveness

- If curriculum is viewed as providing resources to support instruction, how does one measure the efficacy of the curriculum?
  - How easily can teachers use the materials to implement effective instruction?
  - How easily can teachers adapt the materials to their contexts to implement effective instruction?

- Tension between a view of teachers making professional decisions in use, adaptation, and non-use of materials and strong technical implementation
The Study

• How do teachers use the district mandated curriculum materials?
• What are the impacts of this use on students’ achievement?
Significance of the Study

- Framed not as “fidelity of implementation” as a measure in evaluating the curriculum
- Instead framed as “teachers as decision-makers in their classrooms” and trying to better understand
  - The decisions teachers make
  - The reasons for these decisions
  - The impact on student achievement
- In particular, trying to understand these issues in the context of urban classrooms where teachers perceive unique constraints on teaching and there have been particular policy responses
Research Design

• *Connected Mathematics Project (CMP)* as the instructional materials
  – most widely used of the NSF-funded middle grades instructional materials

• Large urban district in Northeast of about 45,000 students
  – Uses CMP
  – Has had a Local Systemic Change project that has supported intense, CMP-based professional development
  – Studying a district under “ideal” conditions for the implementation of materials, but otherwise has the other typical issues of urban districts
Research Design

• Multiple methods design
• Population study of teachers’ use based on survey data and student achievement data (March 2009)
• Case studies of 5 middle grades teachers in 2 schools (October 2008)
  – Interviews and videotaped observations of teachers about their planning and execution of lessons
  – Benchmarking assessments of student achievement in the observed classrooms
  – Interviews with school administrators
Two distinct profiles of use

• Implementer – Technical implementation of the written lessons provided by the teacher materials with small adaptations
  – Clear use of student pages (e.g., students read aloud from student pages during instruction
  – Strong use of the teacher materials and ancillary materials
  – Varying quality of use of standards-based instruction (based on observations)
Designers

- Designer – Uses the materials, in conjunction with others, to design and teach a lesson
  - Use of student materials as a source of problems, but less reliance on teacher materials
  - Used the materials for the goal in the broader curriculum
  - Adaptation to their instructional realities (McClain & Cobb, 2003)
  - Varying quality of use of standards-based instruction (based on observations)
## Quality of Lesson by Years of Experience

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;5 years</td>
<td></td>
<td></td>
<td>Ms. E</td>
</tr>
<tr>
<td>2-5 years</td>
<td></td>
<td>Ms. T</td>
<td>Ms. L</td>
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<tr>
<td></td>
<td></td>
<td>Ms. M</td>
<td></td>
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<tr>
<td>&lt;2 years</td>
<td>Ms. G</td>
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</tbody>
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Possible Implications/Discussion

• Do we want all teachers to be implementers?
  – What is the place for designers in the urban school context?
  – If not, what policies can support designers without constraining their options?
  – What are the implications for teacher education and professional development if the goal is for all teachers to be implementers in the urban context?

• Does one have to go through the implementer stage to move to high quality designer?