Instruction and its Improvement: The Infrastructure Challenge

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The Distributed Leadership Studies
http://www.distributedleadership.org

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“We have one hunter and one gatherer... Everyone else is a consultant”
Overview

• To maintain and improve the quality of instruction, we have to get beyond an implementation mindset and instead adopt a *diagnostic and design* mindset.

• System and organizational *infrastructure* must be central in our diagnosis and design work.

• We must anchor our diagnosis and design work in instruction.
Diagnosis and Design

- **Diagnosis** = identify nature or cause of something

- **Design** = shaping the organization and system infrastructure to purposes
Infrastructure
Organization and System Infrastructure
Organization and System Infrastructure
Organizational Routines

- Organizational Routines are “repetitive, recognizable patterns of interdependent actions carried out by multiple actors.” (Feldman & Pentland, 2003)
Maintaining and Improving Instruction by Designing Organizational Routines

- **Adams School**: Breakfast Club, grade level meetings, Teacher Talk, Teacher Leaders, Five-Week Assessment, Literacy Committee, and Mathematics Committee.

- **Baxter School**: Cycle Meetings, Leadership Team Meetings, Literacy Committee, Math/Science Committee.

- **Kosten School**: Report Card Review, Grade Book Review, Lesson Plan Review, Faculty Meetings, Grade Level Meetings.

- **Kelly School**: Skill Chart Review, Professional Development.
# Organizational Routines at Adams School

<table>
<thead>
<tr>
<th>Functions</th>
<th>Tools</th>
<th>People</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Five Week Assessment</strong></td>
<td></td>
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<tr>
<td>- Formative evaluation</td>
<td>- Standardized Tests</td>
<td>- Language Arts Coordinator</td>
</tr>
<tr>
<td>- Teacher Accountability</td>
<td>- Standards</td>
<td>- Assistant Principal</td>
</tr>
<tr>
<td>- Monitor Instruction</td>
<td>- Student Assessments</td>
<td>- Principal</td>
</tr>
<tr>
<td>- Teacher Development</td>
<td></td>
<td>- Teachers</td>
</tr>
<tr>
<td><strong>Breakfast Club</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Teacher Development</td>
<td>- Research Articles</td>
<td>- Teachers</td>
</tr>
<tr>
<td>- Build Professional Community</td>
<td></td>
<td>- Language Arts Coordinator</td>
</tr>
<tr>
<td><strong>School Improvement Planning (SIP)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Identify Instructional Priorities &amp; Resources</td>
<td>- Previous Year SIP</td>
<td>- Principal</td>
</tr>
<tr>
<td></td>
<td>- District Guidelines</td>
<td>- Administration</td>
</tr>
<tr>
<td></td>
<td>- Test Score Data</td>
<td>- Teachers (approved LSC)</td>
</tr>
<tr>
<td><strong>Classroom Observations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Teacher Development</td>
<td>- School Protocol,</td>
<td>- Principal</td>
</tr>
<tr>
<td>- Monitor Instruction</td>
<td>- District Protocol</td>
<td>- Assistant Principal</td>
</tr>
<tr>
<td>- Accountability</td>
<td></td>
<td></td>
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<tr>
<td><strong>Real Men Read</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Student Motivation and Support</td>
<td>- Books</td>
<td>- Language Arts Co-ord.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Assistant Principal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Principal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Community Members</td>
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</tbody>
</table>
Asking the Difficult Questions about Organizational Routines

• What is the theory of action behind the routine?

• What arguments explain and evaluate the routine?
  – Why should it work?
  – Why might it not work?
  – What are the advantages of this routine?
  – What are the disadvantages of this routine?

• How is the routine connecting with/anchored in teaching and learning?
Infrastructure Matters

- Teachers more likely to seek advice from others of same gender and race
- Prior tie strongly associated with having a current tie
- Formal leaders more likely to provide advice or information
- Teachers in the same grade more likely to receive or provide advice or information
- Teachers more likely to seek advice about a subject from teachers who reported more PD in that subject

Infrastructure Matters

• Individual characteristics are associated with advice and information ties in schools
  – Small negative effects of same gender and career stage

• However, aspects of the formal organization are more strongly associated with in school ties:
  – Same grade assignment: More likely to have a tie
  – Assignment to multiple grades: Less likely to have a tie
  – Formal leadership position: More likely to have a tie

• Formal leadership position predicted instructional advice and information ties between schools more than anything else
System & Organizational Infrastructure Redesign: The Case of One School District

- Redesigning system and school infrastructure:
  - New mathematics curriculum
  - Investing in professional development of teacher leaders for mathematics
  - Strategic selection of teacher leaders
  - Creation of math coach position in some schools
  - Both district wide and school organizational routines designed and implemented
Math Teacher Leaders and Interactions about Mathematics Instruction

2009-10

2010-11

2011-12
Teacher Leadership and Training as a Marker of Expertise

“Because he’s a second grade teacher....He’s kind of become the math person to see because he’s taken this extra training that nobody else in the building has done, and I know that he’s interested in math so, he’s just one that I’ve gone to that I know focuses very heavily on, I like his beliefs and the way that he has his room set up and the way that he carries himself.”

Karen (1st grade)
Math Coach Transforms Interactions about Mathematics Teaching
“[Emily] really wasn’t our facilitator [last year], though she was my co-worker, just a third grade teacher. I knew she had a wealth of knowledge, I just wasn’t in [her classroom] when she was teaching math. But, now that she’s moved into this math facilitator position, that’s different...

She’s been trained in it. And, she’s gone to school for it and she’s a great coach. She knows a lot about math and I trust her that she has a lot of, a wealth of knowledge... She’s the go-to person.”

Angie (Special Education)
Organizational Routines and Expertise

“We have had that benefit of having [Gabrielle] on the [district] toolbox [routine] and so she was looked upon as you know more of an expert. And she would come back and share everything with us...we kinda felt more in the math loop than maybe some of the other teams who don’t have that connection piece of somebody on the toolbox in their building.”

Clarissa (1st grade)

“our [grade] team plans and we get to collaborate together... our math coach [Mary]... when we’re planning together if we have a question she’s always there to help... she knows a lot...”

Rachel (Kindergarten)
Infrastructure Redesign Promoted Advice and Information Seeking in Mathematics

Average In-Degree for Teacher Leaders and Other Teachers, Auburn Park School District

<table>
<thead>
<tr>
<th></th>
<th>2009-10</th>
<th>2010-11</th>
<th>2011-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toolbox Members (6)</td>
<td>1.60</td>
<td>2.80</td>
<td>2.67</td>
</tr>
<tr>
<td>Fundamental Math Participants (9)</td>
<td>4.33</td>
<td>6.00*</td>
<td>6.00</td>
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<tr>
<td>Math Coaches (3)</td>
<td>6.33</td>
<td>16.33**</td>
<td>18.00</td>
</tr>
<tr>
<td>Other Teachers (256)</td>
<td>1.54</td>
<td>1.60</td>
<td>1.36</td>
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</tbody>
</table>
Infrastructure Redesign Promoted Brokering in Mathematics

Average Betweenness for Teacher Leaders and Other Teachers, Auburn Park School District

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<th>2010-11</th>
<th>2011-12</th>
</tr>
</thead>
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<tr>
<td>Toolbox Members (6)</td>
<td>5.00</td>
<td>75.80*</td>
<td>48.86</td>
</tr>
<tr>
<td>Fundamental Math</td>
<td>32.44</td>
<td>144.33*</td>
<td>115.42</td>
</tr>
<tr>
<td>Participants (9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math Coaches (3)</td>
<td>38.67</td>
<td>248.67**</td>
<td>222.97</td>
</tr>
<tr>
<td>Other Teachers (256)</td>
<td>10.85</td>
<td>24.81*</td>
<td>11.90</td>
</tr>
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System and Organizational Infrastructure & Teachers’ Instructional Beliefs and Practice

Change in Teachers’ Beliefs about and Reported Practices in Mathematics

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<th>2009-10</th>
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<tr>
<td><strong>Beliefs about Mathematics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td>3.35 (0.5)</td>
<td>3.46*** (0.5)</td>
<td>3.51*** (0.5)</td>
</tr>
<tr>
<td><strong>Reasoning and Problem-Solving</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practices</td>
<td>2.39 (0.4)</td>
<td>2.52*** (0.4)</td>
<td>2.64*** (0.5)</td>
</tr>
</tbody>
</table>

Notes: Means are based on teachers from 12 schools with over 70% response rates who responded in every year of the survey. Significant differences are for comparisons to 2009-10. ***p<.001; **p<.01, *p<.05; +p<.10
Infrastructure Redesign & Instruction

Context

Teacher

Teaching Practice

Materials

Students

Context
Infrastructure Redesign & Instruction

Context

Teacher

Teaching Practice

Materials

Students

Context
A System View: Infrastructure and Subject Matter

English Language Arts

Mathematics
The Case of Science
More At:

- http://www.distributedleadership.org
- http://www.distributedleadership.org/DLS/Presentations.html