Examining The Relationship Between Teachers' Mathematics Content And Pedagogy Perspectives And Equity Pedagogy

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Study Sample

• Analysis of forced response LAMP items
  – Out of 143 consenting teachers with completed LAMPS, randomly chose 100 teachers with both pre- and post- responses for the statistical analysis of change; 2008-2009

• Analysis of open response LAMP items
  – Out of the 100 consenting, matched pre-post teachers in the forced response sample, we chose a purposeful, random sample (purposeful in that we randomly chose from those people who actually wrote written responses)
Theoretical Frame for Analysis

• Mathematics Content Perspectives
  – Responses identified on a continuum

• Mathematics Pedagogy Perspectives
  – Responses identified on a continuum
  – Teacher Directed, Problem-Based/Student Centered, Learner Responsive Pedagogy (MCP, 2009)

• Equity Pedagogy Perspectives
  – Codes based on equity literature theory and research
  – Ten codes, each as an example or non-example
Findings on Teacher Change

- Mathematics Content Perspective
  - Statistically significant change, pre to post
  - Effect size: .338
  - Improvement of about 13 percentile points

- Mathematics Pedagogy Perspective
  - Statistically significant change, pre to post
  - Effect size: .385
  - Improvement of about 15 percentile points
### Equity Pedagogy

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>RWP</td>
<td>Real-world problems or examples</td>
</tr>
<tr>
<td>EST</td>
<td>Explicit student tasks and work</td>
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<tr>
<td>ETL</td>
<td>Explicit talk about the meaning and use of mathematical language</td>
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<tr>
<td>ETR</td>
<td>Explicitly talks about, or addresses ways of reasoning</td>
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<tr>
<td>ETMP</td>
<td>Explicitly points out strategies, talks about mathematical practices</td>
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<tr>
<td>IT</td>
<td>Quality of Instructional time spent on mathematics</td>
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<tr>
<td>EDC</td>
<td>Encouragement of a diverse array of mathematical competencies</td>
</tr>
<tr>
<td>ESE</td>
<td>Emphasis of student effort and message that effort will pay off.</td>
</tr>
<tr>
<td>AU</td>
<td>Autonomous student work opportunities</td>
</tr>
<tr>
<td>EE</td>
<td>Expressed expectation that everyone will be able to do the work.</td>
</tr>
</tbody>
</table>

*In use, equity codes include an ending of E (Example) or N (Nonexample)*
Relationship to Equity Pedagogy

• Mathematics content and equity pedagogy
  – Statistically significant differences between P and IPC
  – Teachers with IPC content perspectives have more favorable equity codes than teachers with P content perspectives (effect size 0.65)

• Mathematics pedagogy and equity pedagogy
  – Results suggest strong associations between mathematics pedagogy perspectives and equity pedagogy
  – Significant differences between TD and PSC (Effect size: 1.54)
  – Significant differences between PSC and LRP (Effect size: 0.39)
  – Significant differences between LRP and TD (effect size: 0.93)
Overall Relationship

Teacher Directed Pedagogy and (superficial) Procedural Perspectives on mathematics content do not support equity pedagogy well.

Problem-Based/Student-Centered and Learner Responsive Pedagogy, and Integrated Procedural/Conceptual perspectives on mathematics content do support equity pedagogy.
Theme: Change in Language

Pre: Jose is thinking that rectangles have 90° angles. (Coded C, ETRE)

Post: Jose knows a square can be a rectangle, but a rectangle cannot be a square. (Coded C. ETRE, ETLE)
Change in Content Perspective and Change in Equity

Pre: When finding answers to problems mentally it is easier to break it down into easier chunks. (Coded P, ETRE)

Post: Jenny broke apart the problem into easier chunks. She understands the relationships between percents and fractions and understands that you can double 60 by 5 to show 1/5. (Coded C, ETRE, ETMPE)
What this all means

Teachers can support equity pedagogy, by seeing mathematics as an integrated procedural/conceptual content, and effective mathematics pedagogy as one that is learner responsive.
Thank You!!