A Lesson Study Project: Connecting Theory and Practice Through the Development of an Exemplar Video for Algebra I Teachers and Students

2010 NCSM Annual Conference
San Diego, CA    April 19 - 21, 2010
Dr. Anne Papakonstantinou  
RUSMP Director  
MLI Director & Co-PI  
apapa@rice.edu

Mr. Richard Parr  
RUSMP Director of Curricular & Instructional Programs  
MLI Manager  
rparr@rice.edu

Ms. Monica Kendall  
HISD Director of Secondary Mathematics  
MLI Co-PI  
mkendall@houstonisd.org
Rice University
School Mathematics Project (RUSMP)

• Provide a bridge between the Rice University mathematics research community and Houston-area mathematics teachers

• Help teachers and administrators better understand the nature of mathematics, the effective teaching and assessing of mathematics, and the importance of mathematics in today's society

• Founded on the belief that sustained instructional changes can best be supported through the development of professionalism among teachers

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RUSMP Goals

• Increase the mathematical knowledge of Houston-area teachers
• Promote and model effective teaching and assessment of mathematics with active student involvement in the learning process
• Encourage the appropriate use of technology and manipulatives in the teaching of mathematics
RUSMP Goals

• Provide an awareness of minority and gender issues

• Provide strategies to actively engage struggling students, English language learners, and underrepresented minorities in learning mathematics

• Understand and promote research-based teaching and learning of mathematics
RUSMP Goals

• Form a local mathematics education network to implement national, state, and local reform efforts in mathematics education

• Develop mathematics teachers' leadership capacity

• Create innovative curricula in mathematics

• Advise developers of mathematics programs and curricula
Houston Independent School District

• Largest public school system in Texas
• Seventh largest public school system in the United States with nearly 200,000 students and 12,000 teachers
• First recipient of the Broad Prize for Excellence in Urban Education (2002)
Demographic Comparison
HISD with State of Texas

<table>
<thead>
<tr>
<th></th>
<th>HISD</th>
<th>Texas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>61%</td>
<td>48%</td>
</tr>
<tr>
<td>African-American</td>
<td>28%</td>
<td>14%</td>
</tr>
<tr>
<td>Anglo</td>
<td>8%</td>
<td>34%</td>
</tr>
<tr>
<td>Asian</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>American Indian</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Economically Disadvantaged</td>
<td>81%</td>
<td>57%</td>
</tr>
<tr>
<td>Limited English (LEP)</td>
<td>31%</td>
<td>17%</td>
</tr>
<tr>
<td>At-Risk</td>
<td>68%</td>
<td>48%</td>
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Rice University
Mathematics Leadership Institute (MLI)

- Develop a cadre of 80 lead teachers in mathematics in the two partner school districts
- Establish a leadership program at individual campuses to provides mathematics content and pedagogical support for the *entire* mathematics department at that campus
Lesson Study Project

• Motivation for the project
• District-wide walk-through observations of all Algebra I teachers
  – 279 Algebra I teachers
  – 39 high schools
Lesson Study Project

- Rice University School Mathematics Project’s role
- MLI’s role
- Why lesson study
Lesson Study

• Study curriculum and formulate goals
• Plan
• Conduct research
• Reflect
• Replicate

Lewis, Perry, and Murata  2006
Lesson Study Project

- MLI lead teachers’ role
- Lesson selection, development, and refinement
- Taping and production of the exemplars video
Lesson Study Project

- District-wide professional development to support the project
  - Across the district concurrently with video production
Lesson Study Project

- The exemplars video "Mathematics in Motion" (Best Practices in Algebra I)
- Use of the lesson study protocol in schools to develop additional lessons
Lesson Study Project’s Impact

• District
• Teachers
• Students

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Accolades

The video "Mathematics in Motion" (Best Practices in Algebra I) received a 2009 Texas School Public Relations Association (TSPRA) Gold Star Award for excellence in school communications.
Rice University School Mathematics Project
http://rusmp.rice.edu

Houston Independent School District
http://www.houstonisd.org

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