Models for Evaluating MSP Projects
Workshop for State Leaders and Evaluators of Teacher Professional Development

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Professional Development Design Process
for Systemic Reform of Mathematics and Science Education

Set Goals → Plan → Do → Reflect

System Context → Critical Issues

Knowledge & Beliefs → Strategies

Product: Designing Effective Professional Development For Teachers Of Science and Mathematics
Program Stages

- Planning
- Implementation
- Impact
First Steps in Initiating an Evaluation

- Finding an evaluator
  - External/internal
  - Independent/within program
- Cost for evaluation
- Scope for evaluation
Evaluation for Program Planning
Compatibility between Program Design and Evaluation Design
No causation without manipulation
Experimental and Quasi-Experimental Designs

- Pre-Post Test
- Pre-Post Test with a Control Group
- Post Test Only
- Post Test with a Control Group
- Random Assignment
- Multiple Levels
  - Teacher – Student
  - School – Student
- Trend Analysis—Baseline, Periodic Assessments
Professional Development Program Design

- Selection of Teachers
  - All
  - Volunteers
  - Purposeful

- Selection of Schools
  - All
  - Volunteers
  - Purposeful
  - Stratified
Evaluation of Program Theory

- Research Based
- Logic
Figure 2. Elements of Teachers’ Professional Growth

Disequilibrium

Exposure

- Classroom Practices
  - Content
  - Instruction
  - Assessment
  - Teacher and student roles

- Professional Involvement
  - Networking
  - Leadership

Modeling

Existence

Proof

- Knowledge and Beliefs
  - About students
  - About mathematics
  - About pedagogy
  - About the teaching profession

Experimentation

Reflection

= Elements of Professional Growth

= Domains of Professional Teaching
Simon, 1997 Mathematics
Teaching Cycle
Logic Model Framework for Listing Program Activities

<table>
<thead>
<tr>
<th></th>
<th>Policy</th>
<th>Management</th>
<th>Curriculum and Instruction</th>
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<tbody>
<tr>
<td><strong>INPUTS</strong></td>
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<td><strong>ACTIVITIES</strong></td>
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<td><strong>INTERIM</strong></td>
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<td><strong>OUTCOME</strong></td>
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# Professional Development Activities

<table>
<thead>
<tr>
<th>ACTIVITIES</th>
<th>Curriculum and Instruction</th>
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<tbody>
<tr>
<td>D4) MTLs support other teachers</td>
<td>D5) Teachers -after school weekly classes</td>
</tr>
<tr>
<td>E4)</td>
<td>E5)</td>
</tr>
<tr>
<td>F4) MTLs monthly two-day workshops on leadership</td>
<td>F5)</td>
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<td>F6)</td>
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<tr>
<td>D6) Teachers -one-week summer institute</td>
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<td>E6) Teachers -bi-weekly grade level meetings</td>
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## Professional Development Interim Outcomes

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<th>INTERIM</th>
<th>Curriculum and Instruction</th>
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<tr>
<td></td>
<td>I4) MTLs’ beliefs, attitudes, and practices become aligned with reflective teaching</td>
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<td>J4) MTLs gain leadership skills and recognize teachers’ growth in reflective teaching</td>
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<td>L4)</td>
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Program Implementation and Evaluation
Guskey’s Five Critical Levels of Evaluating Professional Development

1. Participants’ Reactions,
2. Participants’ Learning,
3. Organization Support for Change,
4. Participants’ Use of New Knowledge and Skills
5. Student Learning Outcomes.


Some Issues Related to Evaluating the Implementation of Professional Development

- Time Frame
- Proof-of-Concept Studies
- Breadth vs. Depth
- Formative Studies
- Aligned Measurement Instruments
- Living with Imperfection
- Analytic Horizon Mismatch with Funding
Frequently Used Methods in Evaluation of Professional Development Programs

- Case Studies
- Experimental Designs
- Multi-Variant Designs
- Trend Analyses
Frequently Used Tools in Evaluating Professional Development Programs

- Surveys
- Observations
- Interviews
- Focus Groups
- Teacher Logs
- Content Knowledge Tests
Web Sites with Evaluation Instruments

- www.consortium-chicago.org
- http://ed.uwn.edu/CAREI/cetp
- http://www.horizon-research.com
- ptambe@inverness-research.org
- http://www.addingvalue.org/
Less Frequently Used Tools

- Content Coverage Maps
- Concept Maps
- Student Work Samples
Program Impact
Value-Added Effect on Mathematics Scores from Grade 4 to Grade 5, 2003-2005
Value-Added Effect on Spanish Scores from Grade 4 to Grade 5, 2004-2005
## Value Added Effect of AlAcMiMa Schools for Grade 5 by Content Area for Cohort 1 2004-2005

| Grade 5 Subject Matter | AlAcMiMa Parameter Estimate | Standard Error | t Value | Pr > |t| |
|------------------------|-------------------------------|----------------|---------|------|-----|
| Mathematics            | 1.26                          | 0.68           | 1.86    | 0.06 |     |
| Spanish                | -0.07                         | 0.58           | -0.12   | 0.90 |     |
MMSD Mean Math Scale Scores for Grades 4, 8, and 10 2000-2005
MMSD Math Mean, First and Third quartile, and 5th and 95th Percentile Scores for Grade 8 2000-2005
Normalized Scale Score Effect Size Between MMSD and WI for Math Grade 8 2000-2005

### Effect Size

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<tr>
<th>Year</th>
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<tbody>
<tr>
<td>2000</td>
<td>1706</td>
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<tr>
<td>2001</td>
<td>1697</td>
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<td>2002</td>
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<td>2004</td>
<td>1761</td>
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<tr>
<td>2005</td>
<td>1666</td>
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Evaluators Need to be Realistic

- Program design will change
  (27 of 40 evaluators, 68%)
- Collecting student data is challenging
- Access to school, teachers, and students can be difficult
- There is a trade off between collecting data and writing about results
- Qualitative and quantitative data collections requires a balance
What Has Worked for MSP Evaluators

- Continual Communication with Stakeholders
- Conducting Case Studies
- Analysis of Teacher-Learning Logs a Value to Stakeholders
Final Thoughts

It is not the direction of the wind, but the set of the sails that guides the boat.