Preliminary Research Results: Math Teachers’ Circles
Brian Conrey, Brianna Donaldson, Michael Nakamaye, Kristin Umland, and Diana White

Quantitative Research Question
Does participating in a Math Teachers’ Circle summer immersion workshop result in increased Mathematical Knowledge for Teaching (MKT)?

Study Description
- Conducted over 2 summers – 2010, 2011
- Used Learning Math for Teaching Instrument
- Subscales used:
  - Number Concepts and Operations (both summers)
  - Geometry (first summer only)
  - Proportional Reasoning (second summer only)
- Offered at beginning and end of 4-5 day workshops

Learning Math for Teaching Instrument
- Developed at University of Michigan
- Extensively tested to establish psychometric soundness
- Has been linked to increased student achievement in a large scale study (Hill, Rowan, & Ball, 2005)
- Scores are standardized to a normal distribution with mean 0 and standard deviation 1

Results

<table>
<thead>
<tr>
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<th>Summer 2010</th>
<th>Summer 2011</th>
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</thead>
<tbody>
<tr>
<td>Sites</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total participants</td>
<td>69</td>
<td>118</td>
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<tr>
<td>Mean increase for number concepts and operation (in standard units)</td>
<td>29 (p &lt; 0.001)</td>
<td>29 (p &lt; 0.001)</td>
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Implications
- Preliminary evidence shows that Math Knowledge for Teaching is positively impacted by MTCs
- Need not always teach MKT directly
- Although statistically significant gains were not seen in the areas of geometry proportional reasoning, further study is needed

Qualitative Research Question
How do participants view the workshop and its impacts on them as learners and teachers?

Study Description
- Analyzed final evaluations from three sites from Summer 2010
- Used “constant comparison” method to look for themes

Sample Final Evaluation Questions
1. Please tell us your thoughts about the workshop.
2. Please comment on how the support you received from others impacted your learning.
3. Did you learn any new approaches to problem solving this week? Please explain.
4. Do you anticipate changing anything about how you teach mathematics as a result of this workshop? If so, in what ways?
5. Please comment on what you considered to be the most useful aspects of this week.

Results
Participants reported a wide variety of gains as a learner of mathematics and gains as a teacher of mathematics.
- As learners
  - Challenged by both the content and problem solving
  - Many had not previously been asked to work collaboratively to this extent
  - Felt supported by facilitators throughout the week.
- As teachers
  - Intended to require more justifications and explanations from students
  - Some plan to incorporate more group work, more open ended problems and questions requiring exploration, and more mathematical discussions into their classrooms
  - Reported learning teaching strategies and effective questioning techniques from observing the facilitators

Participant comments:
- “This workshop was awesome! It was great to network with other teachers to see what they are doing in their classrooms”.
- “It was really exciting to see so many people excited about math education in our state.”

Implications
Self-reported changes in teachers knowledge and practice suggest the need for a more detailed study involving classroom observations.