Connections Between Mathematics Research and Practices Used in Classrooms

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Research Question

What are the relationships between class observations, research, and methods course theories?
Hypothesis

- My experiences in the math methods course and outside research will directly align with the teaching practices and learning processes I observed in fifth grade classrooms.
Methodology

**Observation Type I**
- Observe mathematics lesson for 30 minutes
- Record actions every 3 seconds

**Observation Type II**
- Time and record when any activity starts and stops
- Calculate how much time used in each time management category
Observations

- Teacher/Student Interaction
- Time Management
- Teacher Instruction
- Student Learning
Teacher/Student Interaction Results

- Teacher talking; student listening: 34%
- Student asks question; teacher gives related answer: 25%
- Teacher asks question; student gives related answer: 18%
- Students talking to other students: 13%
- Others: 10%
connections

math methods course

• Importance of dialogue and interaction between teacher and student

judith reed, nctm

• Significance of using questions to guide instruction
• Verbalize student thoughts

observation

• Significant time spent with only teacher talking, students listening
• Questioning occurred during large amount of instruction time
Time Management Results

- Engaged: 57%
- Transition: 31%
- Passive: 10%
- Active: 2%
## Connections

<table>
<thead>
<tr>
<th>Math Methods Course</th>
<th>National Council of Teachers of Mathematics</th>
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<tbody>
<tr>
<td>• Multiple experiences in one class session</td>
<td>• Significant time needed to fully develop problem solving skills</td>
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<tr>
<td>• Minimal transition times</td>
<td>• Students need time to process skills being learned</td>
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### Observation

- Focus on student learning
- Short transition times
- Most of class time spent with students engaged
Teacher Instruction Results

- In front of room: 31%
- Answering questions to students: 22%
- Talking while walking around the room: 22%
- Listening to students: 17%
- Others: 8%

Others: 8%
Connections

Math Methods Course

• Focus on innovative practices, not “drill and kill” testing items

• Living at the overhead projector

National Council of Teachers of Mathematics

• Need opportunities to verbalize mathematical thinking

Observation

• Most of class time spent at projector while lecturing

• Minimal time spent listening to students talk about lesson
Student Learning Results

- 35% Completing work with limited or no assistance
- 32% Asking questions relevant to concept
- 19% Looking at another student's work for help
- 14% Others
Connections

Math Methods Course
• Relation of student learning to teacher instruction
• Articulation by teachers of specific criteria and directions

National Council of Teachers of Mathematics
• Knowledgeable of how to connect math concepts
• Connection of math concepts to other subjects

Observation
• Students actively learning by completing work
• Small amount of time spent making connections to prior math and outside contexts
Variables Considered

- Lesson lasting longer than 30 minutes
- Accuracy of portrayal of classroom with only one visit
Conclusion

Hypothesis Refuted

• Many of the observations aligned with research and course experiences.
  – Time Management → Methods Course → Research
  – Student Learning → Methods Course → Research

• Other observations contrasted greatly.
  – Teacher Instruction → Methods Course → Research
  – Teacher/Student Reaction → Methods Course → Research
Implications

• Transferring from theories at the university level to practices in the field
• Leads to self-reflection as a future teacher
• Conscious of how research and classroom practices are related