ASSESSING NOVICES’ SKILLS IN LEADING MATHEMATICS DISCUSSIONS

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PROBLEM STATEMENT

- Increasing focus on preparing novices to develop skill with high-leverage teaching practices → Need ways to assess novices’ skills with enactment of practice
- Prevailing approaches to assessment often do not provide adequate evidence of novices’ skills with specific practices
- Many factors beyond sheer skill influence novices’ enactment of specific practices
RESEARCH QUESTIONS

1. Is it possible to design a standardized assessment to assess skill with leading mathematics discussions? And if so, what might a standardized assessment afford?

2. How do novice teachers’ discussion leading practices in standardized assessments correspond with typical classroom practice?
WHOLE CLASS DISCUSSION

- A period of relatively sustained dialogue among the teacher and multiple members of the class
- In a whole-class discussion, participants respond to and use one another’s ideas to develop ideas about specific content

TeachingWorks, 2015
# Decomposing the Work of Leading a Whole Class Discussion

## Assessment Focus

<table>
<thead>
<tr>
<th>Discussion Enabling</th>
<th>Discussion Leading</th>
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<tbody>
<tr>
<td>Selecting a task</td>
<td>Framing</td>
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<tr>
<td>Anticipating student thinking</td>
<td>- Launching</td>
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<tr>
<td>Setting up the problem</td>
<td>- Eliciting</td>
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<tr>
<td>Monitoring student work</td>
<td>- Orienting</td>
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<td></td>
<td>- Making contributions</td>
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<td>- Concluding</td>
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- **Framing** - Concluding
- **Orchestrating** - Making contributions

## Practices

- **Practices for orchestrating discussions** *(Smith & Stein, 2011)*
- **Talk moves** *(Chapin, O’Connor, & Anderson, 2013)*
- **Decomposing practice for novice learning** *(Boerst et al., 2011)*
WHAT DO MEAN BY STANDARDIZED?

<table>
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- **Common mathematical tasks:**
  - “Make number sentences for 10” (elementary)
  - “Proofs of the Pythagorean Theorem?” (secondary)

- **Lesson plan supports:**
  - Descriptions of possible student solutions
  - Commentary on the mathematics of the task
  - Detailed instructions for setting up the task
## VIEWING CHECKLIST

- Organized by area of work
  - framing
  - **orchestrating**
  - recording/representing

- Included specific practices within each area (e.g., probing)

- Identified specific techniques for enacting each of the practices within each area of work

- Developed evidence statements for each of the specific techniques which are scored as present, not present, or NA
### VIEWING CHECKLIST

**Area of Work: Orchestrating**

- **Practice 1:** Eliciting student thinking
- **Practice 2:** Probing student thinking
- **Practice 3:** Orienting students towards the thinking of others
- **Practice 4:** Making contributions

<table>
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<th>Activity</th>
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<th>Not Present</th>
<th>NA</th>
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<td>Asking students to speak louder as needed to ensure that the class can hear others’ ideas</td>
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<td>Posing questions to students about others’ ideas and contributions including asking students to comment on, add to, or restate another student’s ideas</td>
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<tr>
<td>Supporting the listening of the class through the use of moves that require all students to respond to others’ work</td>
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<tr>
<td>Encouraging students to attend, listen and respond to peers’ contributions in order to maintain productive and focused interaction</td>
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METHODS

- Pilot study with first year teachers \( (n = 17) \)
  - 9 Elementary teachers, 8 Secondary teachers
  - Diverse contexts and preparation programs

- Data sources
  - Video records of observation discussions
  - Video records of assessment discussions (15 - 45 min)
METHODS OF ANALYSIS

- Phase 1
  - Research team independently analyzed videos
  - Discussed individual results to reach consensus using repeated viewing and code book
  - Subset was analyzed by trained rater (85% agreement)

- Phase 2
  - Compared results across videos to examine assessment’s capabilities
RESEARCH QUESTIONS

1. Is it possible to design a standardized assessment to assess skill with leading mathematics discussions? And if so, what might a standardized assessment afford?

2. How do novice teachers’ discussion leading practices in standardized assessments correspond with typical classroom practice?
WHAT DID THE STANDARDIZED ASSESSMENTS AFFORD?

- Elicited and revealed a range of skill in discussion-leading practices
WHAT DID THE STANDARDIZED ASSESSMENTS AFFORD?

- Provided fine grained detail about the performance of individual teachers
- Accounted for classroom norms
HOW DID THE STANDARDIZED ASSESSMENTS COMPARE WITH TYPICAL CLASSROOM PRACTICE?

- Framing Score
- Orchestrating Score
- Recording Score
- Overall Score

(scored the same on the assessment discussion)
HOW DID THE STANDARDIZED ASSESSMENTS COMPARE WITH TYPICAL CLASSROOM PRACTICE?

- scored higher on the assessment discussion
- scored the same on the assessment discussion
HOW DID THE STANDARDIZED ASSESSMENTS COMPARE WITH TYPICAL CLASSROOM PRACTICE?

- scored higher on the assessment discussion
- scored the same on the assessment discussion
- scored lower on the assessment discussion

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DISCUSSION

- Potential of standardized assessments
  - Research tool for exploring patterns in beginning teachers’ skill
  - Role of scaffolds in focusing assessment
  - Importance of having a clear decomposition of practice

- Implications for use in teacher education
  - Reveal patterns across and within candidates
  - Allow for targeted support and program-level design
  - Improve efficiency for teacher educators
THANK YOU!

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