INTERPRETING STUDENT THINKING: WHAT CAPABILITIES DO NOVICES BRING TO TEACHER EDUCATION?

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BACKGROUND

- **Decomposition of Practice**: Teaching can be broken down into smaller parts that can be taught, studied, and rehearsed by preservice teachers. The parts must maintain their integrity so that they can be reintegrated into the practice of teaching (Grossman & Shahan, 2005).

- **Interpreting Student Thinking**: A teaching practice that entails characterizing what a student thinks based on evidence from the student’s words, actions, or writing. Such characterizations can be used as the basis for future teaching. Early attention to interpreting is crucial because:
  - people are likely to develop ways of doing this in everyday life;
  - errors in focus, scope, and/or evidence are consequential for students’ learning and life opportunities; and
  - it is a rich territory in which to notice, and work to address/counteract, the impacts of bias.

- **Simulations**: An approximation of practice that places authentic practice-based demands on a participant. Can provide information that is not feasible or practical to provide from interaction with students.

METHODS

- **Participants**: 23 preservice elementary teachers in the first week of an teacher education program.

- **Simulation assessment**.

- **Analyzed interpretations focusing on**:
  - the mathematical process used by the student;
  - the student’s understanding of the process;
  - anticipating process and understanding of work on a similar problem; and
  - marshalling available evidence to support claims.

### Student Role Protocol to Standardize the Assessment

**What the student is thinking**

- Uses an algorithm that is not conventional in the U.S. in which you add the same amount to the minuend and subtrahend to keep the difference the same.
- Applies the method correctly.
- Understands that the process adds 10 ones to the minuend and 1 ten to the subtrahend.
- Understands that the process creates a subtraction problem that has the same answer as the original problem.
- Understand the answer as the difference between two numbers.
- Understands that 10 ones is equivalent to 1 ten.

**General orientations towards responses such as**:

- Talks about digits in columns in terms of the place value of the column (e.g., 14 ones).

**Responses to anticipated questions**

<table>
<thead>
<tr>
<th>Efficient</th>
<th>Inefficient</th>
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<tbody>
<tr>
<td>35%</td>
<td>61%</td>
</tr>
<tr>
<td>Recognizes the need for more information before anticipating</td>
<td>4%</td>
</tr>
<tr>
<td>Anticipates understanding incorrectly or without evidence</td>
<td>56%</td>
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</tbody>
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CONCLUSIONS

- Preservice teachers can use written work and interaction with a “student” to describe the student’s process and anticipate the application of the process to a similar case.

- Preservice teachers may experience more challenges in interpreting a “student’s” understanding, such as
  - Identifying core components of understanding in need of attention.
  - Using evidence to support claims about understanding.
  - Remembering information that could be used as evidence for claims about core components of understanding.

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