

Unpacking Teacher Knowledge and Practice

Objectives of Study 1

- To explore teachers' knowledge of students' mathematical thinking (a component of Pedagogical Content Knowledge)
- · To design tasks that enhance teachers' knowledge of students' math thinking

Pedagogical Content Knowledge

To investigate the links between teachers' pedagogical content knowledge (PCK) and specialized content knowledge (SCK) from the standpoint of practice

Design of the Study

- Task based interviews (Pre)
- Classroom observations
- Task based interviews (Post)
- Anticipation tasks

P1: Explore Teacher Knowledge of student thinking

- P2: PCK-SCK Task
 Design and
 Implementation
- Analysis of classroom episodes
- Teacher-researcher Meetings
- Task based interviews (Pre)
- Classroom observations
- Task based interviews (Post)
- Anticipation tasks

P3: Investigate Teacher Knowledge of student thinking

Tasks in Teacher—Researcher Meetings

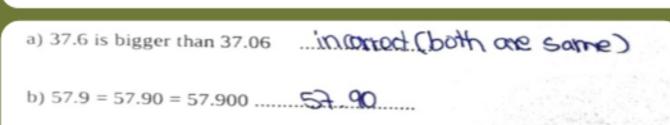
Arrange the following decimal numbers in descending order 0.658, 3.7, 2.45, 5.63

- What are the possible (correct and incorrect) ways in which students will solve this problem.
- Study these students' responses and explain their thinking

Response 1: 0.658, 5.63, 2.45, 3.7

Response 2: 3.7, 5.63, 2.45, 0.658

Can you devise some problems to check whether your students are making these errors?



c) 5.8 is smaller than 5.08in. cornect (both one same)

d) 37.02 is same as 37.2 . Co. wect



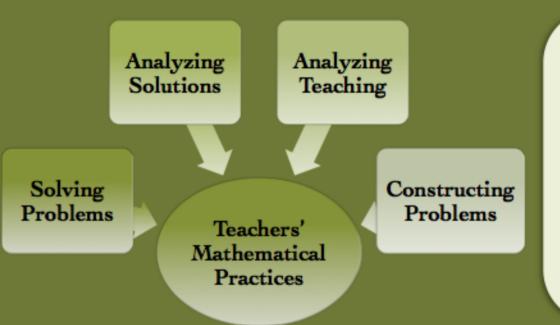
Tasks designed by the researchers and student response chosen by the teacher for discussion

Objectives of Study 2

- To report teachers' practices of doing mathematics
- To investigate teachers' construction of mathematical practices



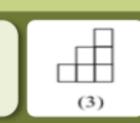
Why Mathematical Practices?

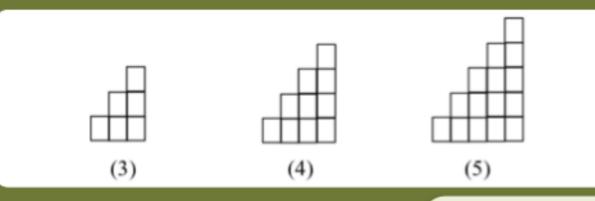


Develop sensitivity to mathematical opportunities in the classroom teaching (Ball & Bass, 2002);
Develop mathematical knowledge by learning to ∂o mathematics (Glaserfeld, 1991) and competence for learning and teaching mathematics (Naidu, 2014)

Solving problems using "special cases"

In an n-step staircase made from unit cubes, how many cubes are needed? (Here is the 3-step staircase.)





Special cases to understand the mathematical structure



Special cases to verify the process

Number of steps in the staircase	Total number of bricks required
3	6
4	10
5	15
6	21
10	55
15	120

Special cases to generalize the solution

Teachers adopted the practice of for three different purposes