

Unpacking Teacher Knowledge and Practice

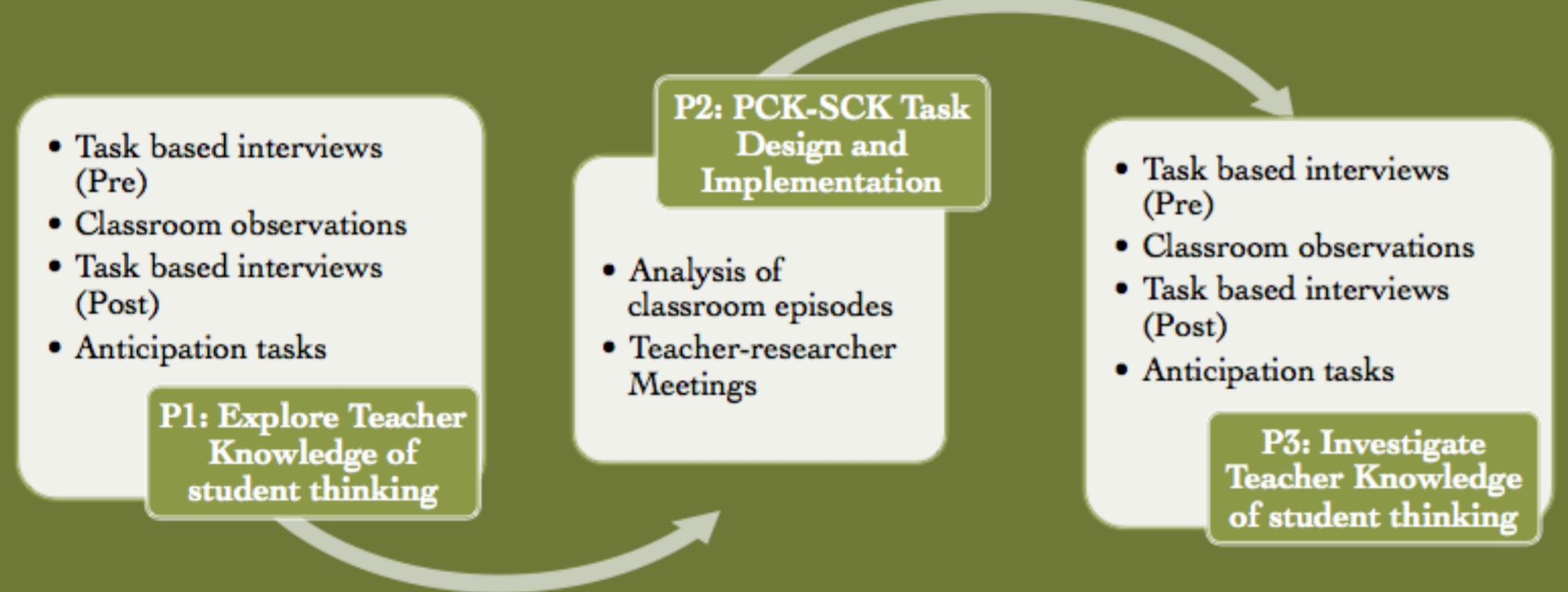
Objectives of Study 1

- 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

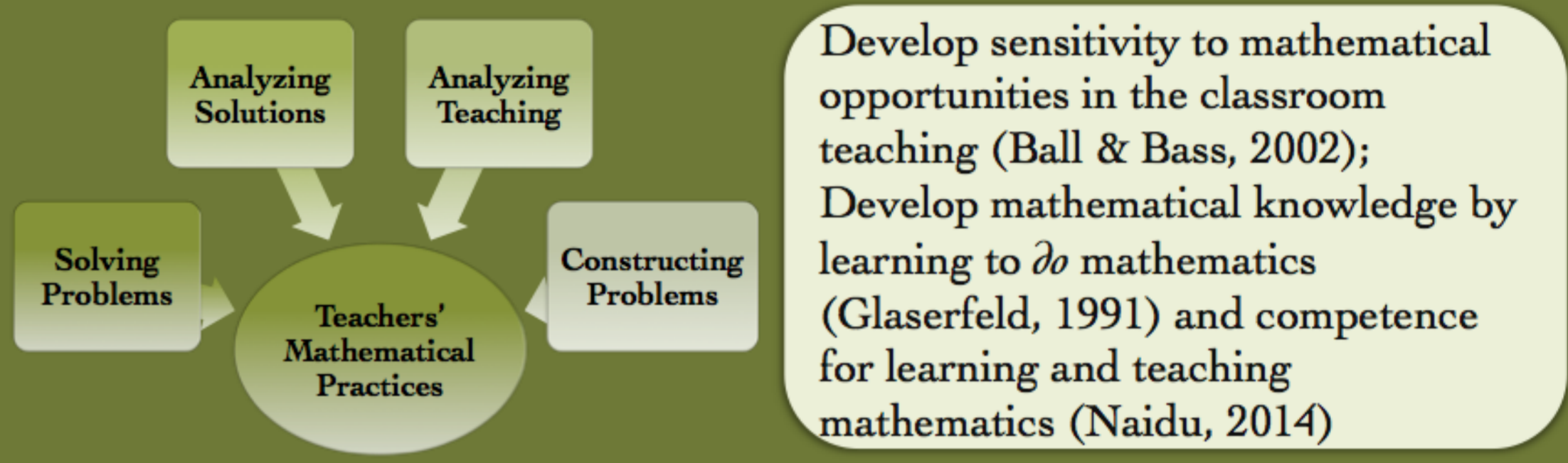


Objectives of Study 2

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



Why Mathematical Practices?



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?



a) 37.6 is bigger than 37.06 ...*incorrect (both are same)*

b) 57.9 = 57.90 = 57.900*57.90*

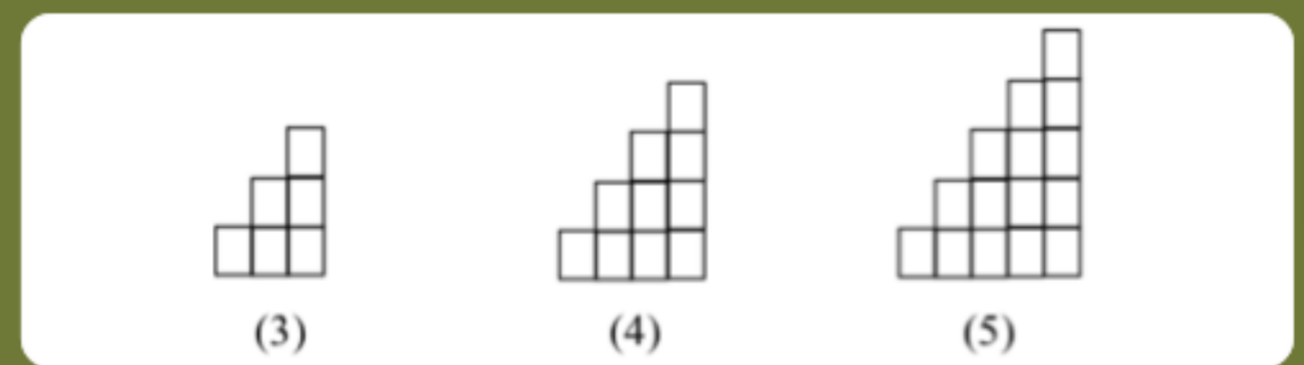
c) 5.8 is smaller than 5.08*in correct (both are same)*

d) 37.02 is same as 37.2 ..*correct*

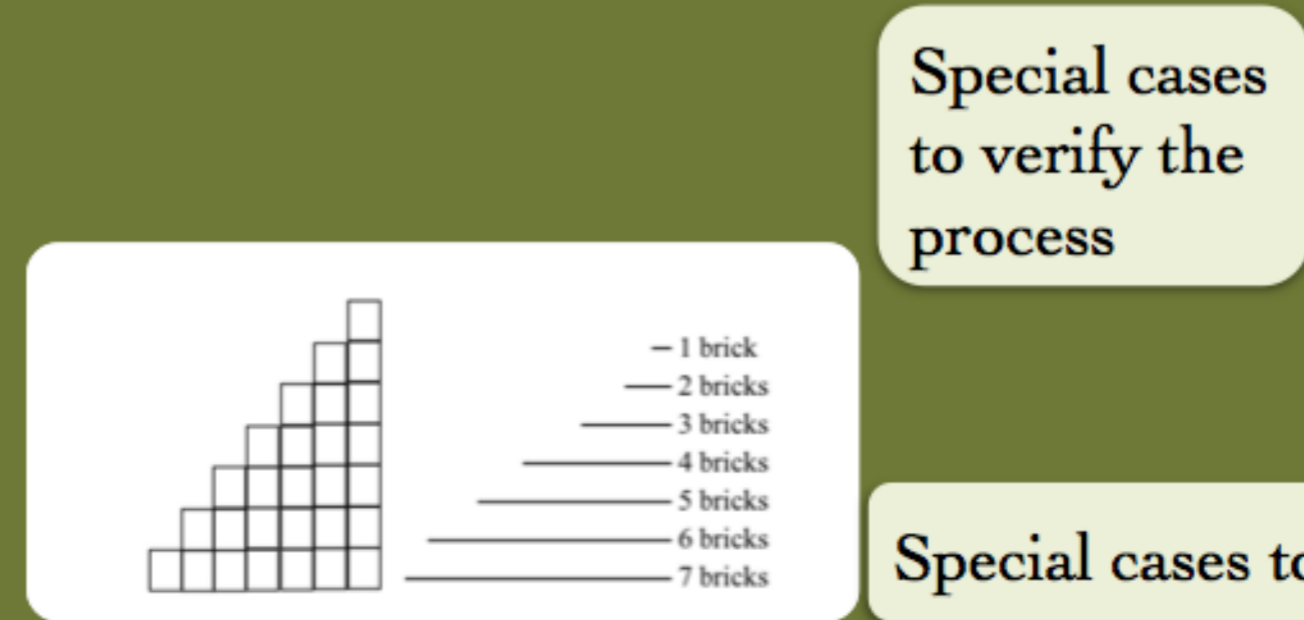
Tasks designed by the researchers and student response chosen by the teacher for discussion

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



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 verify the process

Teachers adopted the practice of for three different purposes