# Computational Estimation of Elementary School Teachers

Dr. Yea-Ling Tsao
Minnesota State University Mankato


Ting-Rung Pan
Dun Hua Elementary School
Taipei, Taiwan

## Abstract

The purpose of this study is to investigate teachers' understanding and knowledge of computational estimation, and teaching practice toward to computation estimation. There are six fifth-grade elementary teachers were participated this study; three teachers with math or science major and three teachers with non-math/science major. The researchers interviewed six fifth-grade elementary mathematics teachers regarding their understanding about the knowledge of computational estimation, computational estimation strategy and how to teach estimation topic.


The interview content included that : (a) educational background of the teacher; (b) teachers' knowledge toward computational estimation. For example, do you understand this term that is "computational estimation"? How would you explain it? What is its importance? (c) how teachers teach computational estimation. For example, how do the teachers promote computational estimation with daily life experience, how do teachers support students to understand computational estimation? Please describe with examples. In addition, the researchers will use five computational estimation problems to understand how the teachers develop students' computational estimation. Each teacher received the interviews for three times and the interview time was about 90 minutes. The major findings are as follows:


In the teacher's knowledge about computational estimation aspect, six teachers can explain the meaning of computational estimation, and use computational estimation strategy to solve problems flexibly. Their computational estimation strategies to solve problems include front-end, rounding, compatible number, special number, use of fractions, nice number and distributive property. All of teachers use special numbers; five of them use rounding and compatible number strategies. Four

teachers use nice numbers.  Only one teacher use front-end strategy and distributive property.

Researchers also analyzed teaches' understanding toward computational estimation and their backgrounds; the data shown that the teachers with mathematics/science major were more abundant of the knowledge about computational estimation relatively. They can incorporate mathematics course with computational estimation, or integrate with other mathematics concepts, require students to examine the answer and its rationality by computational estimation, introduce the life situation with teaching to improve student's learning motivation. The teachers are non-mathematics/ science majors but were extremely interested in mathematics had initial understanding toward the related knowledge of computational estimation. And they can incorporate mathematics course with computational estimation, or integrate with  other mathematics concepts, require students to examine the answer and its rationality by computational estimation, introduce the life situation with teaching to improve student's learning motivation. The teachers are non-mathematics /science major and not interested mathematics has less computational estimation strategy for their teaching.