

A wizard at mathematics as teacher?

A study into the knowledge of fractions of preservice elementary school teachers

Hendrik Van Steenbrugge, Martin Valcke & Annemie Desoete
Ghent University, Department of Educational Studies, H. Dunantlaan 2, 9000 Gent

Introduction

- There is ample research focusing on elementary school students' knowledge of fractions
- Research is scarce that focuses on elementary school teachers' fraction knowledge (Newton, 2008)

This is a critical observation since information about teachers' knowledge of fractions can contribute to the understanding of students' difficulties in learning fractions

Aim

The present study focuses on preservice teachers' knowledge of fractions and centers on two research questions

- To what extent do preservice teachers master the procedural and conceptual knowledge of fractions?
- To what extent do preservice teachers master a deep knowledge (= to understand how things have to be taught) concerning fractions?

Methodology

- 290 respondents: 184 first-year trainees, 106 last-year trainees enrolled in 2 teacher training institutes
- 1 test: builds on tests used in previous studies + exercises from elementary school mathematics books

Results

- The fraction knowledge of preservice teachers reflects findings of research considering the fraction knowledge of elementary school students
 - Gap between procedural & conceptual knowledge
 - Conceptual knowledge: ratio > part-whole > quotient > operator > measure
- Deep knowledge
 - poor results: mean = .42 (maximum = 2)
 - Teacher training year did not had a significant impact

Conclusion

- Questions about the nature & impact of teacher training settings
- More research is needed about (preservice) elementary school teachers' knowledge of mathematics in general and fractions in particular in view of developing an integrated picture of school effectiveness and school performance