

## PRE-SERVICE ELEMENTARY TEACHERS' SITUATIONAL STRATEGIES IN DIVISION

Anu Laine, University of Helsinki; Sinikka Huhtala, Helsinki City College of Social and Health Care; Raimo Kaasila, University of Lapland; Markku S. Hannula, University of Turku & Erkki Pehkonen, University of Helsinki

Here we will present some preliminary results of our research project on pre-service primary teachers' views of mathematics (the project financed by the Academy of Finland; project #8201695). We have collected survey data of 269 pre-service primary teachers in the beginning of their mathematics studies. Here we will concentrate on teacher students' understanding of division. Division is an essential arithmetical operation, and there are many misconceptions connected to it. These might be: "You must always divide the bigger number by the smaller one" (e.g. Hart, 1981) or "You can operate with the digits independently:  $84 \div 14 = 81$  because  $8 \div 1 = 8$  and  $4 \div 4 = 1$ " (Anghileri, Beishuizen & van Putten, 2002).

Understanding of division with decimal numbers was measured by task  $16.8 \div 2.4$ . About half of the students (51 %) could do the calculation. Students used different approaches in solving the problem. Using quotitive division and "trial and error" or "repeated addition" had usually led to the right answer. "Operating with the digits independently" had caused the most common wrong answer 8.2 and "dividing in half" led to answer 8.4.

Task "Solve  $7 \div 12$  by using long division algorithm" measured among other things, whether students divided the numbers in right order. 16 % of students divided 12 by 7. In task "Write a word problem to task  $6 \div 24$  and solve it" students seemed to be able to write a word problem little better than to calculate the task. The most common wrong answer was 4. Another usual answer was 0.4. Although tasks  $7 \div 12$  and  $6 \div 24$  were much alike students solutions varied. Situational strategies in solving division tasks seem to depend at least on numbers, problem structure and different concrete situations (cf. De Corte & Verschaffel, 1996).

Our data suggest that mathematical understanding that students have in division is inadequate for teaching division for understanding. During teacher education it is also important that elementary teacher students become conscious of the difficulty of division and of the different misconceptions people have in division so that they can better teach division for their pupils.

### References

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