OPERATIONS WITH RATIONAL NUMBERS IN GRADES 5 TO 7

Jüri Kurvits, University of Helsinki & Tallinn University, jkurvits@tlu.ee

An understanding of rational numbers is a cornerstone of students' mathematical development (Stohl H.D., 2002). But mathematics education researchers and teachers all over the world can attest that students are vocal in their expression of dislike of fractions and other representations of rational numbers (for example, as a decimals or percents) (Moss J., 2005). Of course we have the same situation in Estonia too; it is one of the biggest problems in the middle grades mathematics and good evidence for thinking that way give us national achievement tests in 6 and 9 grades and international tests such as TIMMS (Lepmann L., 2005).

Big number of students has difficulties with rational number different representations because teachers are teaching them lots of rules related to fractions, percents, decimals and afterward students cannot remember any of them. It is very difficult to learn mathematics for students who believe that mathematics is a set of rules to memorize and as a result later students cannot succeed in advanced mathematics; rational numbers also pervade our daily lives. Thus students need to able to understand rational numbers not only for academic success, but also in our lives as citizens.

Also students are trying to integrate their knowledge of rational numbers with what they know about whole numbers, and their whole-number understandings interfere with how children think about different representations of rational numbers, for example, fractions, percents and decimals. "Students make use of their knowledge of whole numbers, to interpret new information about rational numbers. This gives rise to numerous misconceptions, pertaining both to conceptual and operational aspects of numbers" (Vamvakoussi X. & Vosniadou S., 2004).

The paper will present some preliminary results of longitudinal study on rational number and multiplicative reasoning, which began in autumn 2007. During the school year 2007/2008 were tested 5th graders (three parallel class), the same students were tested during the school year 2008/2009 and according to plan they were tested during the school year 2009/2010. Current part of the study is related to transition from whole numbers to rational numbers and misunderstandings that occur in this process and I'm trying to answer the following question: How may prior learning about whole numbers affect later learning about rational numbers in children??

References

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