

## Abstract

Rational number knowledge is an important factor in students' mathematical development. However, many students face difficulties with rational number concepts. This study describes a new educational game, NanoRoboMath, which has been designed to support students' rational number knowledge. Our goal is to examine the design and the nature of the mathematical practice in the game. Four comprehensive school students aged between 11 and 13 years individually played a prototype version of the game. Video recordings and log data of these game sessions revealed that the game was able to elicit mathematical activities related to rational numbers. This version of the game seemed to enable a variety of strategies matching different skill levels and supported arithmetic activities related to different aspects of rational number conceptual knowledge.

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Tomi Kärki is a docent in mathematics and a senior lecturer in mathematics education at the Department of Teacher Education, University of Turku. His research interests include teaching and learning of mathematics, especially geometry and algebra, as well as contextual and technology-enhanced learning in general.

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Erno Lehtinen is a professor of education at the University of Turku and visiting professor in the Vytautas Magnus University. He has worked in several universities in Finland, other European countries and USA. His research has focused on cognitive and motivational aspects of learning, development of mathematical thinking, educational technology, and new forms of expertise in rapidly changing working life. Lehtinen has published about 400 scientific publications. He was president of EARLI 2001–2003 and founding editor-in-chief of the Frontline Learning Research. In 2009 he got the Oeuvre Award of the European Association for Research on Learning and Instruction.