

Year: 2007

Author: Debbie MacCullough

Institution: Penn State University

Title: "A Study of Experts' Understanding of Arithmetic Mean"

Supervisor: Martin Simon

Abstract

Arithmetic mean is a concept which, although simple in form, is quite complicated to fully understand. The purpose of this study was to examine how experts understood arithmetic mean in order to provide articulations of their understandings. The articulation of conceptions of arithmetic mean could give a research-based foundation to future studies. Five participants, each with expertise with arithmetic mean, took part in task-based interviews to probe into how they were thinking of arithmetic mean. Analysis of the interviews led to an articulation of two distinct conceptions of arithmetic mean: understanding the algorithm for arithmetic mean and understanding arithmetic mean as a mathematical point of balance. The experts did not have a readily-available description of how these conceptions were connected. A follow-up interview was conducted with four of the participants to further clarify how they were thinking about both conceptions as arithmetic mean and how these conceptions might be connected. The analysis of the telephone interviews in conjunction with the analysis of the previous interviews led to a hypothesized connection between the conceptions through the use of levelling-off. This hypothesis lays a foundation for future studies of how children may develop a fuller and more connected understanding of arithmetic mean.