

ZMATH 2010b.00111

Panaoura, Areti; Gagatsis, Athanasios; Deliyianni, Eleni; Elia, Iliada

The structure of students' beliefs about the use of representations and their performance on the learning of fractions.

Educ. Psychol. 29, No. 6, 713-728 (2009).

Summary: Cognitive development of any concept is related with affective development. The present study investigates students' beliefs about the use of different types of representation in understanding the concept of fractions and their self-efficacy beliefs about their ability to transfer information between different types of representation, in relation to their performance on understanding the concept. Data were collected from 1701 students in Grade Five to Grade Eight. Results revealed that multiple-representation flexibility, ability on solving problems with various modes of representation, beliefs about the use of representations and self-efficacy beliefs about using them constructed an integrated model with strong interrelations in the different educational levels. Confirmatory factor analysis affirmed the existence of differential effects of multiple-representation flexibility and problem-solving ability in respect to cognitive performance and the existence of general beliefs and self-efficacy beliefs about the use and the role of representations. Results suggested the invariance of this structure across primary (Grades Five and Six) and secondary education (Grades Seven and Eight). However, there are interesting differences concerning the interrelations among those cognitive and affective factors between primary and secondary education. (Contains 3 tables and 1 figure.) (ERIC)

Classification: C23 C33 F43

Keywords: self efficacy; cognitive development; beliefs; problem solving; mathematical concepts; mathematics achievement; mathematics activities; concept formation

doi:10.1080/01443410903229437