

ZMATH 2013b.00461

Izsak, Andrew; Jacobson, Erik; de Araujo, Zandra; Hawley Orrill, Chandra

Measuring mathematical knowledge for teaching fractions with drawn quantities.

J. Res. Math. Educ. 43, No. 4, 391-427 (2012).

Summary: Researchers have recently used traditional item response theory (IRT) models to measure mathematical knowledge for teaching (MKT). Some studies, however, have reported subgroups when measuring middle-grades teachers' MKT, and such groups violate a key assumption of IRT models. This study investigated the utility of an alternative called the mixture Rasch model that allows for subgroups. The model was applied to middle-grades teachers' performance on pretests and posttests bracketing a 42-hour professional development course focused on drawn models for fraction arithmetic. Results from psychometric modeling and evidence from video-recorded interviews and professional development sessions suggested that there were 2 subgroups of middle-grades teachers, 1 better able to reason with 3-level unit structures and 1 constrained to 2-level unit structures. Some teachers, however, were easier to classify than others. (ERIC)

Classification: D69 C49 F40 F70

Keywords: psychometrics; professional development; item response theory; knowledge base for teaching; pedagogical content knowledge; middle school teachers; arithmetic; mathematical knowledge for teaching; fractions; quantities

doi:10.5951/jresmetheduc.43.4.0391 <http://www.nctm.org/publications/article.aspx?id=33415>