MEANING OF THE PART-WHOLE RELATION AND THE CONCEPT OF FRACTION FOR PRIMARY TEACHERS

Elena Castro-Rodríguez, Luis Rico, Pedro Gómez

Universidad de Granada

The part-whole relation is complex and raises questions that affect different disciplines. Researchers have proposed different interpretations of the notions of fraction and rational number (e.g., Behr, Lesh, Post & Silver, 1983; Kieren, 1976). We highlight three kinds of relations in the study of rational numbers—the part whole-relation, the part-part relation, and the functional relation—through which we organize the different subconstructs of rational number. We claim that the meaning of fractions should be understood through three components: their mathematical structure, their representations and their senses.

We performed an empirical study that focused on the meanings that primary future teachers in their initial stage of training have of the multiplicative part-whole relation. We designed a questionnaire for this purpose. The answers were organized according to the presence or absence of the aforementioned components of the part-whole relation. The analysis revealed that the future teachers in early training who participated in this study considered a significant plurality of meanings for the concept of fraction based on the multiplicative part-whole relation and showed different levels of mastery in using this relation. The participants in the study gave priority to the action of dividing, followed by actions of distributing and dividing into parts. In representing this action, the students gave priority to regular figures divided into equal parts. Finally, for the senses of fractions, family situations took priority over mathematical ones in discrete contexts and contexts with continuous surfaces. In continuous linear contexts, however, personal and mathematical situations occurred almost in equal proportion.

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