

PRIMARY SCHOOL STUDENTS' STRUCTURE OF ABILITY IN TRANSFORMATIONAL GEOMETRY CONCEPTS

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ABSTRACT

During the early studies in the field of transformational geometry, researchers argued against the assumption that the mathematical structure is always in accord with the child's cognitive structure. Moreover, there were suggestions that performing transformations is a multi-faceted mental operation. However, it appears that current mathematics education literature does not provide any information about the components of this ability as well as its structure. This paper is based on the pilot results of a large scale project investigating the structure of students' ability in rigid transformations (translation, reflection, rotation). Its purpose is a) to investigate the components that synthesize primary school students' ability in geometric transformations, and b) the structure of this ability. The sample was composed of 166 students from the fourth, fifth and sixth grade. We investigated whether the components that synthesize this ability are the abilities to deal with the mathematical concepts of translation, reflection and rotation or the cognitive abilities such as 1) recognition of image, 2) recognition of transformation, 3) identification of parameters of transformation and 4) construction of image. The comparison of the two models with CFA analyses suggests that both models are statistically significant and that the ability can be viewed from two different perspectives.

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