SP - (16345) - LEARNING ABOUT PROPORTIONALITY THROUGH ENGAGEMENT IN HANDS-ON ACTIVITIES IN PRIMARY SCHOOL

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Short Abstract

Proportionality is considered one of the basic concepts cross-cutting through science and technology subjects and a cornerstone in the middle school mathematics curriculum. Proportional reasoning is also involved in scientific practices related to mathematising, analysing and interpreting data, and modeling. Research shows that students of all ages have difficulties understanding the concept of proportionality and learning to reason proportionally. For the early grades of primary schools, some scholars have suggested that this might be related to the way the topic is taught and have shown that children in grades 2-6 are able to develop a concept of proportionality when involved in appropriate learning processes. Literature also suggests that learning is more effective when students are involved in hands-on activities. In a design-based study, we involved children in grades 2-4 in hands-on, inquiry-based activities, to explore if engagement in different phenomenological domains would promote a development of their understanding of proportionality and ability to reason proportionally. By design, we restrained from teaching the children explicitly about proportionality and looked at how children addressed proportional relations as they emerge naturally from the phenomena observed and the actions carried out. We found that children were able to identify proportional regularities in the observed quantities and make predictions of observations based on those regularities, clearly exhibiting proportional reasoning. The activities carried out included, inter alia, pouring water between recipients of different capacity, measuring volumes and masses of different materials and exploring shadows in daylight.