

What 4th-Year Primary-School Students are Thinking: A Paper Airplane Problem

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Abstract : In recent years, mathematics educators have frequently stressed the necessity of instructing students about models and modeling approaches that encompass cognitive and metacognitive thought processes, starting from the first years of school and continuing on through the years of higher education. The purpose of this study is to examine the thought processes of 4th-grade primary school students in their modeling activities and to explore the difficulties encountered in these processes, if any. The study, of qualitative design, was conducted in the 2015-2016 academic year at a public state-school located in a central city in the Black Sea Region of Turkey. A preliminary study was first implemented with designated 4th grade students, after which the criterion sampling method was used to select three students that would be recruited into the focus group. The focus group that was thus formed was asked to work on the model eliciting activity of the Paper Airplane Problem and the entire process was recorded on video. The Paper Airplane Problem required the students to determine the winner with respect to: (a) the plane that stays in the air for the longest time; (b) the plane that travels the greatest distance in a straight-line path; and (c) the overall winner for the contest. A written transcript was made of the video recording, after which the recording and the students' worksheets were analyzed using the Blum and Ferri modeling cycle. The results of the study revealed that the students tested the hypotheses related to daily life that they had set up, generated ideas of their own, verified their models by making connections with real life, and tried to make their models generalizable. On the other hand, the students had some difficulties in terms of their interpretation of the table of data and their ways of operating on the data during the modeling processes.

Keywords : primary school students, model eliciting activity, mathematical modeling, modeling process, paper airplane problem

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