

## **The Role of Thinking Level in Mathematics Problem Solving: A Large-Scale Log-Based Exploration**

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Understanding students' behavior while solving tasks at various levels is essential for the support educators may provide to students. The current study reports on a large-scale exploration of students' activity in an online learning environment for mathematics, while comparing between lower-order thinking (LOT) and higher-order thinking (HOT) applets, and between grade levels. We analyzed log files of  $N = 32,581$  5th- and 6th-grade students from all over Israel (a full sample of users in the studied platform), specifically comparing scores, completion rates, completion times, and repetition levels in LOT and HOT applets. Using within-subject and between-subject t-tests, we found that students' performance and completion rate on the LOT applets were overall higher than those of the HOT applets, which, combined with other findings, may point to meta-cognitive or motivational processes involved. We also point out to the high rates of students' manipulation of the system in a way that allow them to increase their score. Finally, we found that the various measures we used to characterize students' online activity are not necessarily strongly correlated with each other. These findings will help teachers to take informed decisions regarding the incorporation of digital learning environments in their classrooms.