

Abstract

Research indicates that students have considerable difficulty learning probability. The purpose of this study was to examine how students think about probability and statistics before, during, and after an instructional unit about concepts from the Grade 7 Common Core State Standards. Our research question was: How can students become more proficient with the language of probability, theoretical and experimental probability, and simple and compound events? The study was conducted over a 9 week period. Four students completing sixth grade participated. During the first week, 30-minute pre-assessment interviews were conducted with each student. Then, seven weekly one-hour instructional sessions were designed to be responsive to students' thinking. Post-assessment interviews occurred during the final week. All interviews and instructional sessions were video recorded, transcribed, and analyzed qualitatively in order to understand students' emerging thinking. Initially, all students struggled with the language of probability, distinguishing theoretical from experimental probability, and determining the probability of a compound event. Hence, our instruction focused on these three areas. At the conclusion of the study students had improved their understanding of the language of probability and of differences between theoretical and experimental probability. Students had also gained procedural fluency for constructing tables and tree diagrams but still were hesitant to use these tools spontaneously to calculate compound probabilities. Our research suggests that teachers should not assume that sixth-grade students understand informal probability language prior to instruction. It also suggests that students should be encouraged to systematically represent sample space elements for both simple and compound probability experiments.