Abstract

Several potential challenges are inherent in learning to analyze bivariate data. In this study, we aimed to investigate how students analyze bivariate data and to design an instructional sequence to build their understanding. We were particularly interested in developing students' abilities to use appropriate statistical tools strategically during data analysis. Our participants had recently completed seventh grade and were preparing to enter eighth. We conducted pre-assessment interviews with each participant. During the initial interviews, students did not use scatterplots or best fit lines when it would have been advantageous to do so. Three of the four students struggled to describe trends in data sets. We designed seven one-hour lessons to support students' thinking about scatterplots, best fit lines, and trends in bivariate data. Each interview and lesson was video recorded, transcribed, and analyzed qualitatively. Our qualitative analyses of students' thinking informed the selection of goals and teaching strategies for subsequent instructional sessions. During the initial sessions, we prompted students to collect and analyze their own data. During the third and fourth sessions, we leveraged students' contextual knowledge of the data they had collected to help them recognize linear trends. In the final three sessions, students made predictions about bivariate data by distinguishing between reasonable and unreasonable estimates. Post-assessment results showed that although students generally used scatterplots and best fit lines as intended, they still struggled to recognize their usefulness across multiple situations. Findings indicate students need experiences across multiple contexts to use these data analysis tools in a robust manner.