Abstract

Research indicates that fraction multiplication is a difficult concept for middle school students. Visual fraction models hold potential to help build students' understanding. The purpose of our study was to construct a lesson sequence capable of fostering students' learning of fraction multiplication. Four students participated in our study. All of them had just finished fifth grade. We conducted pre-interviews with each student to assess their pre-existing knowledge. We then designed and taught seven one-hour weekly lessons. At the end of the study, we conducted post-assessment interviews. Each session with students was video recorded, transcribed, and analyzed qualitatively. Our qualitative analyses allowed us to make conjectures about strategies that would be effective to use in teaching sessions each week. Pre-assessment interviews revealed students' struggles with visual fraction models and their reliance on rote algorithms. Therefore, we focused the initial instructional sessions on development of conceptual understanding. Midway through the study, students were still hesitant to use visual models, so we adjusted our instructional techniques. We asked students to solve problems using diagrams rather than number sentences. In later lessons, we explored multiple visual models and asked students to create number sentences to go with them. Near the end of the study, students showed improvement creating models to go with number sentences and creating stories to go with pre-made models. Our study suggests that students who have already learned algorithms may be hesitant to use visual models, but they can benefit from having to explain their problem-solving strategies to peers during instruction.