Abstract

Over the last decade, enrollment in college-level computer science course has been rapidly increasing, even while many departments struggle to keep up with the demand for faculty. This imbalance limits students’ access to instructional support staff in introductory classes, exacerbating students’ difficulty with challenging materials. Previous research suggests that Worked Examples – step-by-step demonstrations of a problem type – can be an efficient pedagogical resource for novices that scales efficiently with large courses. This study sought to determine the potential of worked examples to improve students’ programming performance. After gathering baseline data from one semester of an introductory programming course for non-Computer Science majors, several programming assignments were chosen based on their perceived difficulty. In the next semester, each of these problems were supplemented with a worked example that parallels the problem’s general structure and concepts. Fine-grained log data was collected of students’ usage of the Worked Examples and their interactions in the programming environment. Students’ completion rates, time on task, and execution behavior was compared to the previous semester to determine the effectiveness of the worked examples. A survey was also given to students in the experimental section to gauge student perception of the worked examples. The analysis of this data suggests that students found the Worked Examples helpful, although their impact on student performance was mixed. The results of this experiment could help teachers develop online material for introductory classes more efficiently, but also motivates further investigations into the impact of Worked Examples to support learners.