ABSTRACT

The studies included in this dissertation were completed for the purposes of exploring the nature of learning object (LO) use in introductory statistics classrooms and providing information about the quality of existing, freely-accessible online statistics LOs. Publication-ready manuscripts were written to describe the procedures and outcomes of each study. The first paper summarizes the results of a survey of LO use completed by high school and post-secondary statistics educators. The second paper in this dissertation describes an expert evaluation to investigate the quality of existing statistics applets designed to explain sampling distributions of sample means. The results of this evaluation are used to discuss the overall quality of these tools and to examine the evaluators' assessments of individual tool quality for use in teaching and learning sampling distributions for means. The third paper focused on evaluating the usability of one LO, an applet designed to simulate the construction of confidence intervals for one-sample means and proportions. University students who had completed an introductory statistics course within the past year served as evaluators and completed tasks in a formative usability test to provide information on the strengths and weakness of the applet, barriers to task completion, and suggestions for improving the usability of the applet. Together the manuscripts in this study can impact the way introductory statistics technologies are developed, evaluated, and incorporated into classrooms. In the future, statistics teachers and LO designers and evaluators can incorporate the findings into their own designs, evaluations, and classroom practices. While the use and effectiveness of LOs in statistics education remains a topic in need of additional research, this study provides an initial step toward possible explorations into the uses, evaluation, and design of statistics LOs.