

Statistical Investigation Projects: A Way for Pre-Service Mathematics Teachers to Actively Solve a Campus Problem

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Abstract : As statistical thinking and problem-solving processes have become increasingly important, teachers need to be more rigorously prepared with statistical knowledge to teach their students effectively. This study examined preservice mathematics teachers' development of statistical investigation projects using data and exploratory data analysis tools, following a design-based research perspective and statistical investigation cycle. A total of 26 pre-service senior mathematics teachers from a public university in Türkiye participated in the study. They formed groups of 3-4 members voluntarily and worked on their statistical investigation projects for six weeks. The data sources were audio recordings of pre-service teachers' group discussions while working on their projects in class, whole-class video recordings, and each group's weekly and final reports. As part of the study, we reviewed weekly reports, provided timely feedback specific to each group, and revised the following week's class work based on the groups' needs and development in their project. We used content analysis to analyze groups' audio and classroom video recordings. The participants encountered several difficulties, which included formulating a meaningful statistical question in the early phase of the investigation, securing the most suitable data collection strategy, and deciding on the data analysis method appropriate for their statistical questions. The data collection and organization processes were challenging for some groups and revealed the importance of comprehensive planning. Overall, preservice senior mathematics teachers were able to work on a statistical project that contained the formulation of a statistical question, planning, data collection, analysis, and reaching a conclusion holistically, even though they faced challenges because of their lack of experience. The study suggests that preservice senior mathematics teachers have the potential to apply statistical knowledge and techniques in a real-world context, and they could proceed with the project with the support of the researchers. We provided implications for the statistical education of teachers and future research.

Keywords : design-based study, pre-service mathematics teachers, statistical investigation projects, statistical model

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