

## ABSTRACT

IVES, SARAH ELIZABETH. Learning to Teach Probability: Relationships among Preservice Teachers' Beliefs and Orientations, Content Knowledge, and Pedagogical Content Knowledge of Probability. (Under the direction of Hollylynne Stohl Lee.)

The purposes of this study were to investigate preservice mathematics teachers' orientations, content knowledge, and pedagogical content knowledge of probability; the relationships among these three aspects; and the usefulness of tasks with respect to examining these aspects of knowledge. The design of the study was a multi-case study of five secondary mathematics education preservice teachers with a focus on their knowledge as well as tasks that were used in this study. Data from individual interviews and test items were collected and analyzed under a conceptual framework based on the work of Hill, Ball, and Schilling (2008); Kvatinsky and Even (2002); and Garuti, Orlandoni, and Ricci (2008). The researcher found that the preservice teachers held multiple orientations towards probability yet tended to be mostly objective (mathematical and statistical) with little evidence of subjective orientations. Relationships existed between the preservice teachers' orientations and their content knowledge, as well as their pedagogical content knowledge. These relationships were found more in tasks where they were required to make a claim about a probability within some sort of real-world context. The researcher also found that tasks involving pedagogical situations tended to be more effective at eliciting knowledge than tasks involving only questions.