

ABSTRACT

This study characterizes how a cohort of 33 middle and secondary mathematics preservice teachers' inferential reasoning changed while enrolled in a statistics course designed for future teachers. Changes in inferential reasoning from pre- to post-assessments are analyzed and further elucidated by midcourse clinical interviews conducted with a stratified random sample of 12 participants. Using a modified SOLO taxonomy (Biggs & Collis, 1982, 1989), the average dominant level of inferential reasoning for the cohort shifted from Unistructural to Multistructural over the course. However, considerable variation was evident at the cohort-level *within* specific tasks, and at the preservice teacher-level *across* tasks. While 58% of all participants increased their level of inferential reasoning, growth was more pronounced for secondary teachers with 75% increasing one or more levels compared with 50% for the middle school teacher population. A relationship between informal and formal approaches to inferential tasks was determined as 80% of levels assigned to formal inferential task responses were concordant with the dominant informal inferential reasoning level. Classification of 375 course tasks by *mathematical strands of proficiency* (Kilpatrick et al., 2001) revealed an increased demand for adaptive reasoning occurs simultaneously with the introduction of formal inferential methods. Prior to the topic of statistical inference, the primary proficiency strands emphasized by tasks are conceptual understanding (56%) and procedural fluency (75%). The concepts of center, variability and sample were heavily emphasized in the course while sampling variability was given little attention. Implications for research and the statistical preparation of teachers are offered.