ABSTRACT

LOVETT, JENNIFER NICKELL The Preparedness of Preservice Secondary Mathematics Teachers to Teach Statistics: A Cross-Institutional Mixed Methods Study. (Under the direction of Dr. Hollylynne Lee).

The purpose of this study is to provide researchers, mathematics educators, and statistics educators information about the current state of preservice secondary mathematics teachers' preparedness to teach statistics. To do so, this study employed an explanatory mixed methods design to quantitatively examine the statistical knowledge and statistics teaching efficacy of 236 preservice secondary mathematics teachers (PSMTs) from 18 institutions and then qualitatively identify factors and experiences that PSMTs felt attributed to their preparedness to teach statistics. Due to the mixed method design, three different vantage points were taken, resulting in three articles that can be used to disseminate results.

The first article examines the statistical knowledge of 217 PSMTs in the sample. The results show that these PSMTs do not have strong statistical understandings that are needed to teach statistics to high school students. PSMTs' strengths include identifying appropriate measures of center, while weaknesses involve issues with variability, sampling distributions, p-values, and confidence intervals.

The second article examines the statistical knowledge and statistics teaching efficacy of 217 PSMTs in the sample. The results indicated that these preservice teachers do not have the statistical knowledge needed to teach high school students and are not confident to teach typical topics found in high school curricula. Factors that impact PSMTs' statistical knowledge and statistics teaching efficacy are reported as well as the relationship between statistical knowledge and statistics teaching efficacy. Implications and recommendations for mathematics teacher education programs are discussed.

The third article examines factors and experiences that influence PSMTs'

preparedness to teach statistics. The results suggest that the cohort of teachers entering

secondary mathematics classrooms in 2015 were not well prepared to teach statistics. Four

factors were identified as influencing PSMTs' preparedness to teach statistics: role of

statistical knowledge, role of pedagogical statistical knowledge, impact of dynamic statistical

software, and view of statistics. Specific suggestions are given for how teacher education

programs must rise to the challenge of preparing their graduates to teach these new and

challenging standards.