

## **Abstract**

The purpose of this study was to study the impact of conformity to Statistical Reasoning Learning Environment (SRLE) principles on students' statistical reasoning in Advanced Placement statistics courses. The study encompassed ten different schools in the Southeast United States over a school year. A quasi-experimental design was used to compare teachers with higher and lower levels of conformity to SRLE principles through a matching process used to mitigate the effects of non-random assignment. This matching process resulted in five pairs of similar teachers and schools who differed in self-reported beliefs in the effectiveness of SRLE principles and application of those principles in their instruction.

The impact of teachers' level of conformity to SRLE principles was determined by using an instrument to measure students' statistical reasoning. This instrument was administered as a pre-test after approximately a quarter of the course was completed and re-administered as a post-test at the end of the course. Analysis of covariance with post-hoc analysis was used to compare the development of statistical reasoning between and among teachers' classrooms with self-reported beliefs and practice that were either of low or high conformity to SRLE principles.

Increases in students' statistical reasoning were found at varying levels in both high and low conformity classrooms. Improvements among teachers with low conformity to SRLE principles were less varied and consistent with national averages for improvement by college students. Improvements in classes with high conformity to SRLE principles were more varied, with the students of two teachers with high levels of conformity to SRLE principles showing

large levels of improvement in statistical reasoning in comparison to national averages and those of other teachers within the study. While the comparison between classrooms showing low and high conformity to SRLE principles revealed no statistically significant differences in students' statistical reasoning ability, results from this study suggest that beliefs and practices aligned with SRLE principles show potential to increase students' statistical reasoning at rates above national averages and teachers with similar characteristics. The variation in classrooms with high conformity to SRLE principles suggest the need to further research variables affecting their impact on students' statistical reasoning.