

Stony Brook University The Graduate School

Doctoral Defense Announcement

Physics and Chemistry Teacher Turnover and Equity Issues Related to Advanced Placement Chemistry Enrollment and Performance

By

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Equitable access to advanced science coursework paired with highly qualified teachers is vital to improving the performance and persistence of students in STEM, particularly students traditionally underrepresented in related fields. This dissertation explored predictors of high school physics and chemistry teacher retention, as well as intersectional access to and performance in Advanced Placement Chemistry coursework. These themes are delineated in three distinct observational quantitative studies.

The first study examined teacher-level and school-level predictors of physics teacher turnover of one cohort of physics teachers in New York during the 2012–13 to 2016–17 academic years. Descriptive statistics indicated that 13.2% of physics teachers left public school teaching all together, and 8.5% migrated to work in other school districts. Predictors for physics teacher attrition were professional age, school-level socioeconomic status, school locale, and physics course load. Professional age and school-level socioeconomic status were predictors of physics teacher migration.

The second study examined teacher-level and school-level predictors of chemistry teacher turnover for one cohort of chemistry teachers in New York during the 2012–13 to 2016–17 academic years. Descriptive statistics indicated that 11.6% of chemistry teachers left public school teaching, and 9.1% moved to other school districts. Predictors of chemistry teacher attrition were professional age, urban and rural locale, course load taught in chemistry, certification in chemistry, and teaching in isolation. Predictors for chemistry teacher migration were professional age, student chemistry performance, and teaching in isolation.

The third study applied an intersectional theoretical lens of ethnicity and gender to examine student participation and performance in Advanced Placement Chemistry in the U.S. in 2018-19. Parity was found in terms of access to AP Chemistry when considering gender. However, disparities were evident among ethnic and intersectional groups when considering access and performance. Women were found to have higher failure rates than men, with women of color exhibiting the highest failure rates. Recommendations for policy and practice are discussed to improve access and achievement in advanced physical sciences, as well as to increase the retention of highly qualified physics and chemistry teachers, particularly in urban and rural schools and those serving traditionally marginalized students.

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Dissertation Advisor: Angela Kelly

Place: Virtual Conferencing – Please contact Judy Nimmo, Graduate Program Coordinator, for Zoom access: judith.nimmo@stonybrook.edu