## Superintendent Longevity and Student Achievement in North Carolina Public Schools

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#### Abstract

Researchers examined the relationship between superintendent longevity and district variables on standardized test scores for students in North Carolina. The authors used hierarchical multiple regression to understand if superintendent-specific variables explained variance in student performance over and above district-based variables documented in the research literature. The continuous predictors were the percentage of students who receive free or reduced lunch (FRL), school size, and V X S H U L Q Models Qf CapeQe MeV This study illustrates that the issue of whether superintendents affect student achievement is not an all or nothing proposition. While superintendents can influence student achievement, particularly as their in-state experience increases, there are district predictors that must be considered.

## **Key Words**

superintendent, student achievement, superintendent longevity, free and reduced meals

**R**ole expectations for school superintendents have changed since the Buffalo, New York Common School Council appointed the first superintendent in 1837 to ensure the system operated effectively (Carter & Cunningham, 1997). At that time, the position included re VSRQVLELOLWLHV VXFK DV <sup>3</sup>DGYLVRU WR WKH ERDUG Limited superintendent longevity is consequential for a variety of reasons. First, Kamrath (2015) Due to the inconclusive nature of superintendent-specific variables such as retention in the job and district-specific variables, such as the percentage of students receiving free and reduced lunch on student performance, this study investigated the impact of school superintendent experience on student achievement. To that end, 2016-17 North Carolina Accountability and Testing results for DOO RI WK kthdoWikIriWtsHwfrt used to demonstrate student achievement.

Specifically, North Carolina annually administers End-of-Grade (EOG) standardized tests in reading and mathematics in grades 3 - 8 and an EOG in science in grades 5 and 8. The state also administers End-of-Course (EOC) standardized tests in English II, Mathematics I, and Biology high school classes. A student (2\* RU (2& VFRUH RI <sup>3</sup> - RU KLJKHU RQ D SRLQW VFDOH LV GHHPHG <sup>3</sup>SURILFLHQW ´ 7KH percentage of students who meet proficiency is reported for federal, state, and local accountability purposes.

In this study, researchers examined the relationship between superintendent and district predictive variables on student academic achievement in 2016-17. Student academic DFKLHYHPHQW PHDVXUHV performance composite score, defined as the number of proficient scores on all EOG and EOC tests divided by the number of all scores from those tests. The performance composite was selected because it reflects all EOG and EOC tests, includes multiple grade levels, and is often used to d3}TJETQq3lb4ral, state, and lo

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level of proficient or better for: North & D U R O<sup>th</sup>Lg@d@ Reading EOG, 5<sup>th</sup> grade Math EOG, 5<sup>th</sup> grade Science EOG.

Additional outcomes included the same percentages on the 8<sup>th</sup> grade Reading EOG, 8<sup>th</sup> grade Math EOG, 8<sup>th</sup> grade Science EOG, and the performance composite for all EOG and EOC tests.

## **Results**

Assumptions for each of the seven Hierarchical Regression equations were met: these data were linear as per an assessment of partial regression plots and a plot of studentized residuals against the predicted values. There was independence of residuals according to Durbin-Watson statistics. Visual inspection of a plot of studentized residuals versus unstandardized predicted values also indicated these data were homoscedastic. Collinearity diagnostics indicate that tolerance values did not exceed 0.1 and correlations between predictors were all below 0.5. In one instance, a studentized deleted residual was greater than  $\pm 3$  standard deviations, suggesting the possibility of a data entry or other error. No such issues were evident; thus these data were retained. Also met, as per the Q-

# Predictors of eighth grade reading, math and science proficiency

**Reading**.  $R^2$  for the overall model was 48.9% with an adjusted  $R^2$  of 47.1%, a moderate to large effect size (Cohen, 1988). FRL and superintendent-based variables statistically significantly predicted the standardized test scores for 8<sup>th</sup> grade Reading Proficiency, F(4, 110) = 26.332, p < .0005. Again, one of the four variables <sup>2</sup> FRL <sup>2</sup> added statistically significantly to the prediction, p < .05, however, years of experience as a superintendent in North Carolina was almost statistically significant, p = .07.

**Math.**  $R^2$  for the overall model was 43.8% with an adjusted  $R^2$  of 41.8%, and, much like above, a moderate to large effect size (Cohen, 1988). FRL and superintendent-based variables statistically significantly predicted the performance of 8<sup>th</sup> grade math proficiency, F(4,110) = 21.443, p < .0005. One of the four variables <sup>2</sup> FRL <sup>2</sup> added statistically significantly to the prediction, p < .05, however, years of experience as a superintendent, overall, was almost statistically significant, p = .09.

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