

Differences in Student Achievement as a Function of Principal Experience: A National Analysis

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Abstract: *Examined in this study was the effect of principal experience on student achievement in reading, mathematics, and science in the United States. Data on years of principal experience and reading, mathematics and science performance from the Early Childhood Longitudinal Study-Kindergarten Class of 2010-11 (ECLS-K) were analyzed. Students in schools with experienced principals, principals with 10 or more years of experience, had a statistically significant higher proficiency in reading, mathematics, and science than those students who attended schools with beginning principals with 3 years or less of experience. Implications of the findings are discussed and suggestions for further research are made.*

Keywords: Early Childhood Longitudinal Study- Kindergarten (ELCS-K); beginning principals; experienced principals

Introduction

Predictors of student success, as they relate to principal leadership, were examined by Watkins and Moak (2010). They analyzed three dispositional characteristics of the principal: (a) the principal's experience, (b) level of education, and (c) self-efficacy and three non-principal predictors: (d) gender, (e) school location, and (f) student demographics. Of these six variables, self-efficacy, gender, and student demographics were predictive of student achievement.

Brooks, Wilson, and Jones (2010), in a similar analysis, examined the relationship present between principal gender and years of administrative experience and student academic growth trends. Female principals who had served for 15 years or more had higher student achievement trends than their male counterparts. In fact, a higher percentage of female principals had higher student academic achievement growth than male principals regardless of years of experience as an administrator.

In this age of high-stakes testing and increased focus on school reform, it is important for educational researchers and school district leaders to understand relationships between

leadership characteristics and student outcomes. Gieselmann (2009) examined principal and school factors associated with elementary school student achievement. In contrast to previous researchers, statistically significant differences were not present in student achievement related to principal years of experience, years of teaching, and gender.

Similar to Gieselmann (2009), Huff et al. (2011) analyzed the relationship and predictive value of principal tenure, principal stability, and principal experience in education along with school-level variables on middle school student achievement. Though principal tenure was not statistically significantly related to student achievement, principal stability and principal experience was related to student achievement. Of importance was that schools with high percentages of students from poverty, students identified with a disability, and students of color were often led by principals with less experience and less stability.

The relationship between principal characteristics and student achievement was also analyzed by Knoepfel and Rinehart (2008). In their investigation, principal characteristics were determined to be statistically significant predictors of student achievement. Also noted by the authors was that principals may not have the necessary training to implement change in an era of standards-based reform.

Babo and Postma (2017) further explored the influence of elementary school principals' length of service on student performance by focusing on Language Arts Literacy and Mathematics as measured by a mandated high stakes assessment in one state in the United States. One important finding was that principal length of service was statistically significantly related to student performance in both Language Arts Literacy and Mathematics when controlling for specific demographic indicators that previous researchers such as Siegrist, Weeks, Pate, and Monetti (2009) have identified as influencing student achievement. In general, the longer principals serve in the position the more positive an influence they have on the school's overall student academic achievement.

Highlighting the changing role of the principal from manager to instruction leader, Siegrist et al. (2009) conducted an investigation on the relationship of principal longevity in a school, years of experience in the position, educational level, efficacy, and leadership behavior to the scores of first time takers on a state-mandated assessment. The percentage of students in poverty and principal efficacy were better indicators of student achievement than number of years as a principal or specific leadership behaviors. The researchers noted that the average tenure of principals in the study was less than four years. Given the connection between principal experience and increased efficacy, concern was expressed that the most effective principals were leaving the profession at a high rate.

Similarly, effective leadership practices were the focus of Peckham (2008) who revealed that elementary schools with strong principal leadership, high academic standards, and regular teacher meetings to plan instruction delivered higher third-grade math and reading scores. Using data from the Early Childhood Longitudinal Study-Kindergarten Cohort, Peckham discovered that many children do not enjoy central elements in their schools that optimize

their learning experiences. Strong principal leadership was absent in elementary schools attended by 30% of all children, slightly more than half of all children attended school where their teachers met regularly to organize sequenced and coordinated instruction, and 15% of children attended schools where teacher turnover is an issue.

Further adding to the research regarding principal characteristics and student outcomes, Valentine and Prater (2011) examined the three types of school leaders- managerial, instructional, and transformational. Differences in student achievement were present when schools were grouped according to principal leadership factors. Principal leadership behaviors promoting instructional and curriculum improvement were linked to achievement. Within transformational leadership, the principal's ability to identify a vision and provide an appropriate model had the greatest relationship to achievement. Principal educational level was also positively correlated with each leadership factor.

Hafedh (2017), in a recent dissertation, analyzed the relationship of principal years of experience as an administrator with the academic achievement of students, with areas that principals emphasized in their school practices, and with the size of their schools, with respect to student enrollment. Statistically significant differences were documented between student achievements, particularly in science, at campuses based on principal experience. Additionally, the time that experienced principals spent on discipline and management was less than new and moderately experienced principals.

Statement of the Problem

The role of the principal has changed dramatically in the past 20 years specifically with the increasing pressures of state and federal accountability. The influence of principals on student achievement has been well-documented. In one study of 7,420 Texas principals, Branch et al (2013) revealed that students in schools of exceptional principals showed an increase of 'as much as seven additional months in a single year' beyond those students in schools with less effective principals (p. 65). The demands placed on principals to raise test scores while balancing the compliance requirements of the principalship can be overwhelming. Due to these unique burdens placed on principals, the United States is dealing with a principal retention problem. Burkhauser, Gates, Hamilton, and Ikemoto (2012) documented that one in five principals leave their school after only one year. Therefore, with the strong relationship between principal tenure and student achievement, educational leaders need to be aware of the strategies to retain effective principals. Continued principal turnover could have drastic effects on student achievement and could result in school and district sanctions.

Significance of the Study

Extensive research exists regarding the influence of principals on student achievement as well as a multitude of researchers who have documented the presence of extensive principal turnover. The findings of this study may have practical applications for school district

leaders in crafting support systems and tools to help new principals to grow and develop their skills and help seasoned principals to manage their workloads without burning out. Additionally, this study may have applications for education institutions to provide practical and hands-out training to those individuals who are entering positions of educational leadership. Given the importance of principal effectiveness to the school culture and academic achievement levels, it is imperative that school district leaders comprehend the influence of principal tenure on student achievement and the school's ability to meet state and federal accountability targets. By examining the results of this empirical national study, school district leaders and education policymakers may expose areas for further strengthening in their districts such as principal coaching, training, and incentive pay systems.

Purpose of the Study

The purpose of this study was to examine the extent to which principal experience might be related to differences in the reading achievement of elementary school students. The second purpose of the study was to examine the mathematics achievement of elementary school students as a function of principal experience. The third purpose was to examine the science achievement of elementary school students as a function of principal experience.

Research Questions

The following research questions were addressed in this investigation;

1. What is the effect of principal experience on reading achievement of elementary students?
2. What is the effect of principal experience on mathematics achievement of elementary students?
3. What is the effect of principal experience on science achievement of elementary students?

Method

Research Design

A non-experimental, causal-comparative research design (Creswell, 2014; Johnson & Christensen, 2014) was used for this study. An archival data set from public and private schools in the United States was examined. The independent variable in this study was years of principal experience and the dependent variable were student achievement in reading, mathematics, and science.

Participants

Participants in this study were principals, heads of school, or other administrators who willingly completed the Early Childhood Longitudinal Study- Kindergarten Class 2010-2011

(ECLS-K) in the spring of 2011 (National Center for Educational Statistics, 2011, 2017b). For readers who are not familiar with the ECLS-K dataset, it is the premiere dataset in the United States on children in early elementary grades, as well as on principals in elementary schools. Because this dataset is a national dataset that was obtained by the National Center for Education Statistics, analyses of the dataset are generalizable to the United States, as a whole. Approximately 6,000 administrators completed this survey in the spring of 2011. Administrators provided information to questions regarding their number of years in the position and the proficiency levels of students in the study as either below proficient, proficient, or above proficient in reading, mathematics, and science. For the purposes of this study, principals with three or less years of experience were labelled as *Beginning Principals* and those principals with 10 or more years of experience were labelled as *Experienced Principals*.

Instrumentation and Procedures

Data were obtained from the Early Childhood Longitudinal Study- Kindergarten (ECLS-K) database, and then imported into the Statistical Package for Social Sciences (SPSS) software program. After the ECLS-K data file was converted into a SPSS data file, labels were given to relevant variables used in this investigation. Because data were downloaded from the website of the National Center for Education Statistics, minimal errors in the data are assumed to be present. For technical information regarding score reliability and validity of the ECLS-K Direct Child Assessments testing instruments, readers are directed to the website at <https://nces.ed.gov/ecls/kinderassessments.asp>

Results

Prior to conducting inferential statistical procedures to answer the three research questions, the underlying assumptions of data normality were checked. An examination of the standardized skewness coefficients (i.e., the skewness value divided by the standard error of the skewness) and standardized kurtosis coefficients (i.e., the kurtosis value divided by the standard error of the kurtosis) revealed that three fourths of the coefficients showed departures from normality for the dependent variables, proficiency in reading, mathematics, and science, for both beginning and experienced principals.

Because student achievement in reading, mathematics, and science for beginning and experienced principals were not normally distributed, nonparametric (i.e., Mann-Whitney's *U*) independent samples *t*-tests were used to answer the three research questions. An independent samples *t*-test was an appropriate inferential statistical procedure to use because the independent variable (i.e., principal experience) was dichotomous and the dependent variable (i.e., student achievement in reading, mathematics, and science) was at the interval/ratio level of measurement (Slate and Rojas-LeBouef, 2011).

The nonparametric independent samples *t* test revealed a statistically significant difference in reading achievement between schools with beginning and experienced principals, $U =$

3,811,946.50, $p = .001$, Cohen's d of 0.13. Using Cohen's (1988) criteria, this finding represented a below small effect size. Elementary schools with experienced principals had statistically significantly higher average reading achievement, more than 2.7% higher, than elementary schools with beginning principals. Delineated in Table 1 are the descriptive statistics for the reading performance of students by principal level of experience.

Table 1: Descriptive Statistics for Elementary Student Reading Achievement by Level of Principal Experience

Principal Experience	n	M	SD
Beginning (0-3 Years)	2,022	70.23	22.21
Experienced (10+ Years)	3,583	73.00	19.82

The Mann-Whitney U test revealed a statistically significant difference in mathematics achievement as a function of principal experience, ($U = 3,852,821.00$, $p < .001$). The Cohen's d effect size associated with this difference was 0.12. Using Cohen's (1988) criteria, this finding also represented a below small effect size. Schools with experienced principals had statistically significant higher average mathematics achievement, more than 2.2% higher, than schools with beginning principals. Presented in Table 2 are the descriptive statistics for this analysis.

Table 2: Descriptive Statistics for Elementary Student Mathematics Achievement by Level of Principal Experience

Principal Experience	n	M	SD
Beginning (0-3 Years)	2,022	73.48	18.82
Experienced (10+ Years)	3,561	75.72	18.19

For the third question regarding principal experience and science achievement, the result was statistically significant, $U = 135,590.00$, $p = .042$, Cohen's d of 0.10. Using Cohen's (1988) criteria, this finding also represented a below small effect size. Schools with experienced principals had statistically significantly higher average science achievement, more than two percentage points, than schools with beginning principals. Contained in Table 3 are the descriptive statistics for this analysis.

Table 3: Descriptive Statistics for Elementary Student Science Achievement by Level of Principal Experience

Principal Experience	n	M	SD
Beginning (0-3 Years)	359	66.33	19.88
Experienced (10+ Years)	702	68.52	21.49

Discussion

In this study, differences in student achievement in reading, mathematics, and science as a function of principal experience were examined for elementary students in the United States. Results from this investigation were in agreement with Afzaiez (2017) who documented the presence of differences in the achievement of students based on principal tenure. Students who were enrolled in schools with experienced principals had statistically significant higher percentages who were proficient in reading, mathematics, and science than students in schools with beginning principals. The greatest difference was present for reading proficiency with students having a 2.75% higher average score for students in schools with experienced principals than for schools with beginning teachers.

Recommendations for Future Research

Based on the results of this investigation, several recommendations for future research can be made. First, what are the differences in student achievement as a function of middle or high school experience? Second, how do neighborhood or community differences relate to children's cognitive and social development? Third, how do differences in principals' background characteristics relate to other school characteristics and practices? Researchers are also encouraged to conduct qualitative investigations in which principals are queried regarding their reasons for leaving the profession and/or transferring to a different school campus.

Conclusion

Examined in this study was the effect of principal experience on student achievement in reading, mathematics, and science in the United States. Data on years of principal experience and reading, mathematics, and science performance from the ECLS-K were analyzed. Students in schools with experienced principals, principals with 10 or more years of experience, had a statistically significant higher proficiency in reading, mathematics, and science than those students who attended schools with beginning principals with 3 years or less of experience. School district leaders and education policymakers are encouraged to develop programs to retain principals. As clearly established in this empirical investigation, principal experience clearly matters.

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