

Research Brief

Mississippi Urban Research Center
College of Public Service

June, 2017
Vol. 2, Issue 1

PREFACE

This research brief is the first of three research briefs using data from the Mississippi Department of Education's website for one hundred and forty two (142) school districts in Mississippi. The briefs are Issue 1, Issue 2, and Issue 3 of Volume 2, 2017.

The Relationship between Highly Qualified Teachers and Student Achievement in Mississippi's Urban and Rural Public School Districts

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Abstract

More than two decades of research findings are unequivocal about the connection between teacher quality and student learning. The purpose of this study was to investigate the relationship between the percentage of highly qualified teachers and student academic achievement in Mississippi. Data submitted by public school districts to the Mississippi Department of Education were analyzed to investigate this connection. The primary research questions used to guide this study included: 1) What is the relationship between student achievement and highly qualified teachers?; 2) What is the relationship between school district funding and student achievement; and 3) Are there significant student achievement differences between rural and urban school districts?

Findings indicated a statistically significant relationship exists between highly qualified teachers and student achievement; however, this relationship was not very strong. Also, disparities existed between urban and rural school districts relative to language and math scores, and the relationship between student achievement and expenditures per student was negative. As expenditures per student increased, student achievement decreased. This was an unexpected finding. The literature posits teacher quality as a key determinant of students' academic success. However, current findings failed to document a strong predictive relationship.

Introduction

The purpose of this study is to investigate the relationship between the percentage of highly qualified teachers and student academic achievement. The quality and funding of public education in the United States has been a debatable and controversial topic for many years. This is also true of public education in Mississippi, particularly in comparing urban and rural areas. Many of Mississippi's urban and rural school districts are located in high poverty areas. High poverty refers to school districts where more than half the students qualify for free or reduced price lunches.¹ Studies have revealed that well prepared and well-supported teachers are important for all students, but especially for students who come to school with greater educational needs. Teacher's preparation and qualifications are important factors that contribute to students' academic achievement. According to Hanushek (2005), highly qualified teachers have a significant impact on students' educational performance.²

Impact of the No Child Left Behind Act

The No Child Left Behind Act (NCLB) required all states to develop standardized tests and accountability systems in order to hold teachers and students accountable.³ Under NCLB, states are required to test students in reading and math, and to report the results for both the student population as a whole and for particular subgroups of students. These subgroups include English-learners, students in special education, racial minorities, and children from low-income families.⁴ The major focus of NCLB is to close student achievement gaps by providing all children with a fair, equal, and significant opportunity to obtain a high-quality education.⁵ To meet this end, NCLB required that all students reach proficiency or better in Reading and Mathematics by 2013-2014 school year.⁶ Mississippi, like many other states, have not met this requirement.

Highly Qualified Teachers Requirement

With NCLB, Congress sought to raise teacher quality, particularly in schools serving low-income students through its "highly qualified teacher" provisions.⁷ NCLB required that all new teachers be classified as "highly qualified" by the end of the 2002-2003 school year, and that all teachers had to meet that designation by the end of the 2005-2006 school year.⁸ NCLB recognizes a highly qualified teacher as having the following credentials: (1) must hold a bachelor's degree; (2) certification or licensure to teach in the state of his or her employment; and (3) have proven knowledge of the subjects he or she teaches.⁹

The law requires that states ensure that their teachers are "highly qualified", and that highly qualified teachers are evenly distributed among wealthier schools and schools with high concentrations of poverty.⁴ The goal was to ensure that children of poor families had the same access to good teachers as other students.⁷ Federal legislation has put increased pressure on school systems to staff all classrooms with highly qualified teachers and has focused attention on

the importance of teacher quality for improving outcomes for K- 12 students.¹⁰ As a result, highly qualified teachers are distributed throughout Mississippi's K-12 education school system. Consequently, classes differ regarding whether or not they are taught by a highly qualified teacher.

Overview of Mississippi's Public Education System

The following section helps provides a context for understanding how NCLB's "Highly Qualified Teachers" requirement is implemented in Mississippi. Currently, there are 148 school districts in the state. Mississippi's public education school districts are governed by locally elected school boards and superintendents. In 2013, Mississippi had 492,586 students enrolled in public schools.¹¹ Of those students, 305,157 were enrolled in grades 1-8.

Mississippi schools uses an A-F grading system to identify how well students are performing in school. The grading system considers several indicators, including how well students perform on state tests, whether students show improvement on tests from year to year, and whether students are graduating within four years. The system also factors in how well schools are helping their lowest achieving students make progress toward proficiency.¹¹

The Mississippi Board of Education appoints the State Superintendent of Education, sets public education policy and oversees the Mississippi Department of Education (MDE). MDE is responsible for implementing state and federal education laws, disbursing state and federal funds, holding schools and districts accountable for performance and licensing all educators. The funds which support the public school system of Mississippi are derived from three sources: Local, State, and Federal.¹¹

In regards to national comparisons, Mississippi is often ranked on the lower end of public education and performance measures. In the 2016 Quality Counts report¹², Mississippi ranked second to last on school performance. Mississippi's average ACT score (which ranked 49th among the states) for the 2012-2013 school year was 18.6, compared to the national average of 20.7.¹³ Mississippi's four-year dropout rate was 12.8% in 2014-15, compared to the national average of 6.8. Many people attribute Mississippi's national low educational rankings with its public education funding level. For example, the national average for per pupil expenditures for the 2012-2013 school year was \$10,700, whereas in Mississippi it was \$8,130, making it the fifth lowest among the states.¹³

Methods

Description of Research Sample. Data for one hundred and forty two (142) school districts in Mississippi were collected from the Mississippi Department of Education's website. Six schools districts were excluded due to data available and/or comparability issues. Total enrollment for the 2013-2014 school year was 492,586 students. Of those students, 49% (243,845) were Black, 46% (224,505) were White, 3% (14,844) were Hispanic, 1% (4,938) were Asian, less than 1% (3,173) were Multiracial, and less than .5% (1,281) were Native American.

Every school in the United States is located in either a rural or urban area. Using Metropolitan Statistical Area (MSA) data available through the U.S. Census Bureau, in Mississippi 13 school districts were classified as urban, and 129 were classified as rural. An MSA is a county or group of contiguous counties that contains at least one city with a population of 50,000 with a metropolitan population of at least 100,000.⁹ Using the Mississippi School District Map, districts were also classified by location and/or region (for example, Northeast, Northwest, Southeast, and Southwest). Table 1 displays background characteristics (total enrollment, per pupil expenditure, highly qualified teacher percentage) by region. Total enrollment for districts by region ranges from approximately 98,000 to 153,000, with the lowest enrollment in the Northeast region and highest enrollment in the Southeast region. Per pupil expenditure ranges from \$9,059 to \$9,918, with the lowest average amount in the Northeast region, and the highest average amount in the Northwest region. As for highly qualified teachers, the highest average is in the Northeast, and the lowest average in the Northwest region. In regards to racial demographics, African Americans have a higher concentration in the Northwest and Southwest regions, and Whites have a higher concentration in the Northeast and Southeast regions (See table 2).

Table 1
District Background Characteristics by Region

Region	Average Total Enrollment	Average Per Pupil Expenditure	Average Highly Qualified Teacher Percentage
Northeast	98,921	\$9,059	97.90
Northwest	114,738	\$9,918	95.23
Southeast	153,523	\$9,125	97.79
Southwest	118,722	\$9175	97.03

Table 2***Student Demographics by Region***

Region	Asian	Black	Hispanic	Native American	White
Northeast	0.53	42.01	3.19	0.13	54.12
Northwest	0.37	73.99	1.28	0.08	21.10
Southeast	1.00	38.42	3.39	0.62	56.55
Southwest	0.53	66.22	1.45	0.08	31.69

Research Design This study used a nonexperimental, quantitative research design. Descriptive, correlational, and independent t-tests techniques were used to analyze secondary data.

Procedure. Secondary data were collected and analyzed to determine whether relationships existed between highly qualified teachers and student achievement. Student achievement were measured using the Mississippi Curriculum Test, 2nd Edition Mathematics and Language scores for grades 3-8 (2013-14 school year). All data were obtained from the Mississippi Department of Education (MDE), National Center for Education Statistics, and the Children's First Annual Report 2012-2013.

Results

Pearson correlations were computed to describe the relationship between percentage of highly qualified teachers, school district funding, and student achievement. As shown in Table 3, statistically significant relationships emerged for percentage of highly qualified teachers, language ($r = .458, p=.001$) and math scores ($r = .448, p=.001$). This implies that as the percent of highly qualified teachers increases, so will language and math scores. The coefficient of determination (r^2) for this relationship was 20.9% for language and 20% for math scores. Thus, language and percent of highly qualified teachers explained 20.9% of the variability in the relationship, and math and percent of highly qualified teachers explains 20%. While there is a direct relationship between these variables, the strength of the relationship is relatively weak.

A significant negative correlation was found between expenditure per pupil expenditure and student achievement as measured with language ($r = -.409, p = .001$) and math scores ($r = -.411, p=.001$) scores. This implies that an inverse relationship existed between the two variables. For example, as per pupil funding increased, language and math scores decreased or vice versa. Pearson correlation analysis revealed that there is a statistically significant relationship between student achievement and percent of highly qualified teachers, but this relationship was also weak.

Figure 1 displays students' language and math scores for the state of Mississippi from 2007-2014. While scores have improved for students in the state overall, discrepancies appear

when urban and rural districts are compared. Rural districts' average score for both math and language subjects was relatively lower than the average scores for urban districts (See Figure 2). This discrepancy cannot be explained by percentage of highly qualified teachers. In fact, when comparing percentage of highly qualified teachers between urban and rural districts, there was a marginal difference of 1% between the two (See table 4).

Table 3
Correlational Analysis

Variables	Language	Math	% HQT	EXP
Language Score	-----			
Math Score	.931**	-----		
% HQT	.458**	.448**	-----	
EXP	-.409**	-.411**	-.369**	-----

**Correlation is significant at the 0.01 level (2-tailed).

Legend:

%HQT – Percentage of Highly Qualified Teachers

EXP- Expenditure Per Pupil

Table 4
Percentage of Highly Qualified Teachers by Type of School District (t-test)

Percent Highly Qualified Teachers	N	Mean	Std
Urban	13	97.87	1.30
Rural	129	96.86	88

^a t (140) = 23.1, $p < .029$, equal variances not assumed

Figure 1
Composite Language Arts and Math Scores for the State of Mississippi

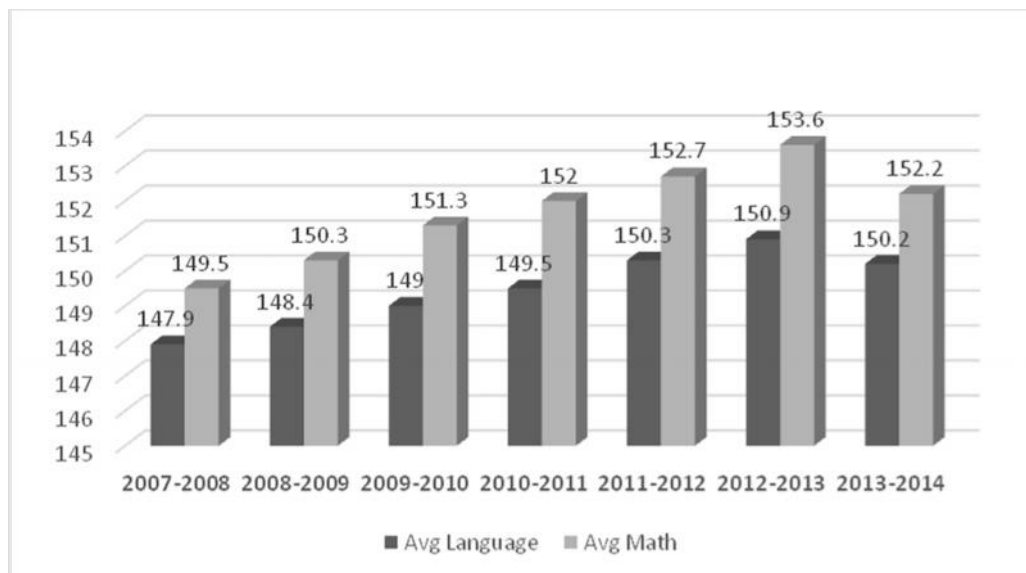
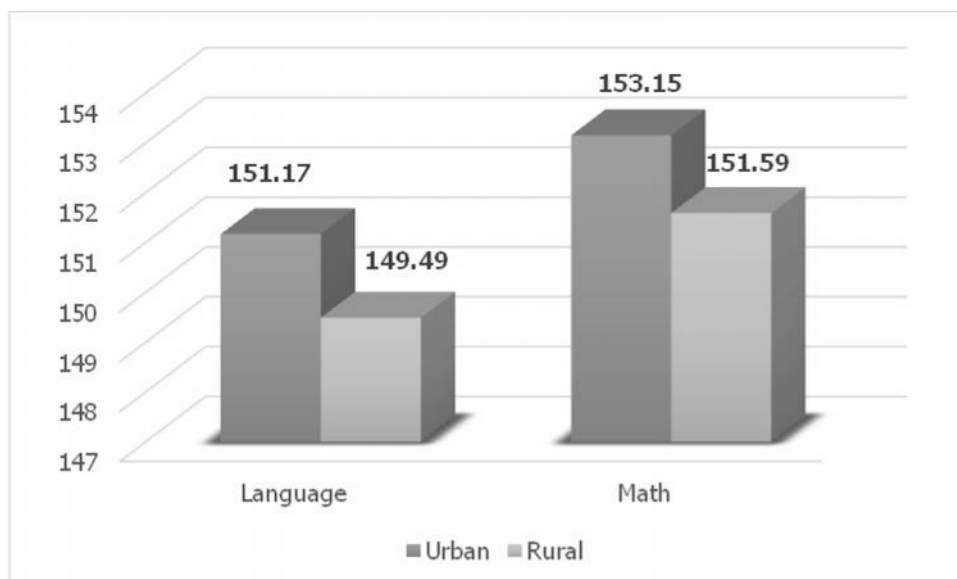


Figure 2
Composite Language Arts and Math by Type of School District



* $t(140) = 2.64, p < .03$

Conclusion

Through the NCLB act, provisions for highly qualified teachers were established to ensure that poor children had the same access to good teachers as other students⁵, and to help close student achievement gaps. However, 16 years after the law was enacted, significant gaps in academic achievement remain. Many believe that teacher quality (measured in this brief as percentage of highly qualified teachers) is a key determinant of students' academic success. However, present findings suggest the relationship between percentage of highly quality teachers and students' academic success is moderate at best.

As stated earlier, test score disparity exists between urban and rural school districts, and the disparity cannot be explained by percentage of highly qualified teachers or per pupil expenditure. If the presence of highly qualified teachers in a district and per pupil funding cannot explain or account for the disparity, what can? The answer to this question can help policymakers and other interested stakeholders develop policies and interventions designed to improve student achievement, especially in academically low performing school districts.

The goal of this research brief was to examine the relationship between highly qualified teachers and student academic achievement in Mississippi's public school districts. A secondary goal was to investigate differences among rural and urban districts. Findings document disparities between urban and rural school districts. Findings also document only a moderate relationship between percentage of highly qualified teachers and students' academic performance. Other research briefs in this educational series will investigate the relationship between students' academic performance, system variables, and accountability score.

References

- ¹ Legters, N. E. (2002). Comprehensive reform for urban high schools: a talent development approach. New York: Teachers College.
- ² Darling-Hammond, Linda and Barnett Berry (2006). Highly qualified teachers for all. *Educational Leadership* 64(3): 14-20
- ³ Hanushek, E.A. (2002) Teacher quality. In Li T. Izumi & W.M. Evers (Eds). *Teacher quality*. Hoover Institution Press Publication No.505.
- ⁴ Klein, A. (2017, February 09). No Child Left Behind Overview: Definitions, Requirements, Criticisms, and More. Retrieved March 10, 2017, from <http://www.edweek.org/ew/section/multimedia/no-child-left-behind-overview-definition-summary.html>

⁵ No Child Left Behind Act of 2001. (2011, January 01). Retrieved March 10, 2017, from <http://www.k12.wa.us/esea/NCLB.aspx>

⁶ Yell, M. L., Katsiyannas, A., & Shiner, J. G. (2006, March 10). The No Child Left Behind Act, Adequate Yearly Progress, and Students With Disabilities. Retrieved March 15, 2017, from http://www.redorbit.com/news/education/424129/the_no_child_left_behind_act_adequate_yearly_progress_and/

⁷ Rothman, Robert (2009). Does highly qualified mean highly effective? Retrieved from <http://www.centerforpubliceducation.org/Main-Menu/Staffingstudents/How-good-are-your-teachers-Trying-to-define-teacher-quality/Does-highly-qualified-mean-highly-effective.html>

⁸ Holloway, E. (2007). Do Qualifications Imply Quality?: The Relationship between “Highly Qualified Teachers” and Student Achievement in Reading and Math in Elementary School (Unpublished master's thesis). Graduate School of Arts and Sciences Georgetown University. Retrieved from https://repository.library.georgetown.edu/bitstream/handle/10822/555861/etd_eth2.pdf;sequence=1

⁹ A Guide to Education and No Child Left Behind-- Pg. 14. (2007, November 20). Retrieved March 10, 2017, from https://www2.ed.gov/nclb/overview/intro/guide/guide_pg14.html#prep

¹⁰ Cavalluzzo, L., (2004). *Is National Board Certification an effective signal of teacher quality?*. Retrieved From www.nbpts.org/sites/default/files/documents/research/Cavalluzzo_IsNBCAnEffectiveSignalofTeachingQuality.pdf

¹¹ Mississippi Department of Education. Retrieved from mde.k12.ms.us

¹² Quality Counts 2016: State Report Cards Map. (2016, December 29). Retrieved from <http://www.edweek.org/ew/qc/2016/2016-state-report-cards-map.html?intc=EW-QC16-TOC>

¹³ Monroe-Lax, D., & Ko, J. (2017). Economic Determinant Analysis of Student Academic Performance in Mississippi Public Schools. *Journal of Public Management & Social Policy*.