

# Differences in Academic Achievement as a Function of Instructional Expenditure Ratio for Students in Poverty

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*In this investigation, the effect of instructional expenditure ratio grouping on the Texas Assessment of Knowledge & Skills Reading, Mathematics, Science, Social Studies, and Writing test passing rates for students in poverty was examined. Data were obtained from the Texas Education Agency on all Texas high school students for the 2006-2007 through the 2010-2011 school years. In all analyses, statistically significant differences, with small to moderate effect sizes, were present in passing rates as a function of instructional expenditure ratio grouping for students in poverty. School districts that had an instructional expenditure of at least 60% had higher TAKS passing rates in all five academic areas for students in poverty than school districts that spent less than 60% on instruction. Suggestions for future research and implications for policy and practice were made.*

*Keywords:* academic achievement, economically disadvantaged, instructional expenditure ratio, poverty, student achievement

## Introduction

Each year, school districts are held accountable for the academic achievement for all students (No Child Left Behind Act, 2002). Federal accountability, enacted in 2002 with the No Child Left Behind Act, required school districts to evaluate student achievement in mathematics, and reading. Student performance data are categorized and reported by ethnicity, gender, and economic status. Minimum standards of achievement must be met in each subgroup for school districts to receive federal monies. Performance measures for student academic achievement are also required by the state of Texas. The Texas Education Agency (2011) evaluated student performance using the Texas Assessment of Knowledge and Skills (TAKS) Reading, Mathematics, Science, Social Studies, and Writing exams. Student performance data were then used to rate school districts each year.

As difficult as it may be to improve student academic performance (Roper,

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1996; Turner, 1999), it is especially challenging to do so for children from poor and low-income families (Lee & Slate, 2014; Reardon, 2013). Students from low-income families are less likely to earn a high school diploma and enroll in college (Ou & Reynolds, 2012; Zwick & Himelfarb, 2011). Low-income students are often the first persons in their family to attend college and, as such, lack the experience and direction from parents, guardians, or other family members in navigating higher education (Babcock, 2014). In the 21st century American economy, citizens should have advanced literacy skills. Schools in America are striving to empower students, especially students from poor families, to attain advanced literacy skills (Haskins, Murnane, Sawhill, & Snow, 2012).

Academic achievement has been documented to be related to monies allocated to instruction by school districts (Arrington, 2010; Cullen, 2012; Cullen, Jones, & Slate, 2011; Cullen, Polnick, Robles-Pina, & Slate, 2015; Cullen, Slate, Polnick, & Robles-Pina, 2015a, 2015b; Diaz, 2008; Helvey, 2006; Jaggia & Vachharajani, 2004; Lesley, 2010). In 2005, Patrick Byrne, President and CEO of Overstock.com, founded the First Class Education organization. Byrne's (2005) enterprise was derived from the principle that 65% of every education dollar should be spent on classroom instruction and he launched a national campaign to require all 50 states to adhere to the 65% mandate.

In Texas, policymakers and legislators swiftly welcomed the 65% decree. Executive Order RP47 was issued by Governor Perry (2005) mandating that Texas school districts spend at least 65% on instructional expenditures within three years. In this executive order, the Texas Education Agency was charged with providing information to public schools specifying instructional expenditure ratios. According to the National Center for Education Statistics (2009), instructional objectives included salaries and benefits for teachers and teacher aides, textbooks, supplies, and purchased services related to the interaction between teachers and students.

Pulitzer Prize winning journalist, George Will (2005) espoused the "65 percent solution" (para. 1) in a *Washington Post* article. Will (2005) declared his support of Byrne (2005), emphasizing that no new funds were required to implement the 65% solution because school districts simply had to reallocate existing resources for instructional purposes. Will (2005) asserted that this financial undertaking would lead to increased student achievement for school districts, however, financial reallocation alone may not considerably increase a school district's academic performance.

Jones and Slate (2010) examined whether school districts allocation of at least 65% of instructional expenditures had a statistically significant influence on TAKS passing rates. School districts that spent less than 60% on instructional expenditures had the lowest passing rate percentages on the TAKS Reading, Mathematics, Science, Social Studies, and Writing tests compared to school districts that spent more than 60% on instruction. School districts that spent between 60% and 65% on instruction also had lower passing rate percentages on all five TAKS tests compared to districts that spent more than 65% on instruction.

In a multi-year study by Jones and Slate (2011), instructional expenditure

ratios and school district accountability ratings were examined. Accountability rating refers to school district and school campus ratings assigned by the 2011 state accountability system (Texas Education Agency, 2011). Districts and campuses are evaluated on their students' TAKS passing rates: (a) commended performance, (b) completion rate, (c) annual dropout rate, and (d) English Language progress. Potential ratings were: (a) Exemplary, (b) Recognized, (c) Academically Acceptable, and (d) Academically Unacceptable. School districts that had instructional expenditure ratios of at least 60% had higher accountability ratings than districts that spent less than 60% on instruction. School district accountability ratings are directly linked to student academic performance and these ratings can have a lasting effect on the public perception of the competence of campus and district personnel (Jones & Slate, 2011).

### **Statement of the Problem**

In Texas, the percentage of students who are growing up in poverty continues to increase. As indicated in the Texas Education Agency Academic Excellence Indicator System Report (2003), in the 2002-2003 school year, students who were economically disadvantaged comprised 51.8% of school age children. By the 2013-2014 school year, this percentage had steadily increased by nearly 1% per year wherein 60.2% of school age children were economically disadvantaged (Texas Education Agency Texas Academic Performance Report, 2014). Growing up in poverty can adversely affect children in countless ways. The academic achievement gap between students who are economically disadvantaged and students who are not economically disadvantaged has been documented over the past few decades (Coley & Baker, 2013; Duncan & Murmane, 2014). According to Ladd (2012), children from low-income families tend to perform less well on standardized tests of mathematics and reading. In addition, children who live in poverty are less likely to complete high school, attend 2-year or 4-year postsecondary institutions, and attain a degree or certificate, which affects job opportunities and earnings (Ladd, 2012). Poverty can have a unique effect on educational goals, and yet notably, education has been identified to be the single most important influencing factor for increasing economic opportunity (Isaacs, Sawhill, & Haskins, 2007). Similarly, Diaz (2008) substantiated that socioeconomic status was the best predictor of academic achievement.

Improved student academic achievement results can be difficult to attain with limited resources, especially for students in poverty (Babcock, 2014; Lee & Slate, 2014; Ou & Reynolds, 2012; Reardon, 2013; Zwick & Himelfarb, 2011). School districts are accountable for student academic success regardless of economic status. Attempts by school districts to close achievement gaps for all students with limited resources have been challenging (Cavanaugh, 2012; Eggers, Snell, Wavra, & Moore, 2005; Zwick & Himelfarb, 2011). Purposeful decisions regarding financial policy are imperative to close achievement gaps that exist. Improved achievement results for students could possibly be attained if thoughtful assignment of financial resources were adjusted or clarified.

### **Purpose of the Study**

Given the emphasis placed on ensuring that Texas high school graduates are academically prepared for postsecondary education, an analysis of the relationship between instructional expenditure ratio and student academic achievement is warranted. The purpose of this study was to determine the extent to which instructional expenditure ratios of school districts were related to the academic achievement, as evidenced by TAKS passing rates for the Reading, Mathematics, Science, Social Studies, and Writing tests, for students who were economically disadvantaged. Taking into consideration that many school districts are encountering budgetary issues and constraints, thoughtful decisions regarding instructional expenditures and student academic performance are critical.

### **Significance of the Study**

Preparing students to achieve academic success in high school and beyond has become a top priority in public education. Higher education is beneficial to not only individuals but to society as a whole and the income-related gap for academic performance and access to higher education is growing (Ou & Reynolds, 2012). Ensuring that all children in poverty have the opportunity for academic success is essential to a growing economy and dynamic society. Schulte and Slate (2011), and Jones and Slate (2010) provided evidence that instructional expenditure ratios by districts are related to student achievement and that monies spent by school districts on instruction have a direct association to student achievement. The results of this study will add to the research regarding instructional expenditure ratio and the connection to student academic achievement. In addition, this study may have practical implications for school districts to improve student academic achievement by purposeful budgeting of educational funds.

### **Research Questions**

The following research questions were addressed in this study: (a) What is the effect of instructional expenditure ratio grouping on the TAKS Reading test for students who were economically disadvantaged?, (b) What is the effect of instructional expenditure ratio grouping on the TAKS Mathematics test for students who were economically disadvantaged?, (c) What is the effect of instructional expenditure ratio grouping on the TAKS Science test for students who were economically disadvantaged?, (d) What is the effect of instructional expenditure ratio grouping on the TAKS Social Studies test for students who were economically disadvantaged?, and (e) What is the effect of instructional expenditure ratio grouping on the TAKS Writing test for students who were economically disadvantaged? These research questions were repeated for each of five years (i.e., 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-

2011) of statewide data analyzed herein. As such, the extent to which a trend was present in student performance in each of the five academic areas analyzed for each of these groups of students was determined.

## **Method**

### **Research Design**

A nonexperimental research design was used for this study (Creswell, 2009; Johnson & Christensen, 2008) to analyze previously collected data from all school districts through the Texas Education Agency Academic Excellence Indicator System database for a period of five years. A nonexperimental research design was used for this investigation because the independent variables used could not be manipulated and because participants were not randomly assigned to any specific experimental groups. By analyzing data from all school districts in Texas, the extent to which differences existed between instructional expenditure ratio and the academic performance of students who were economically disadvantaged could be more readily ascertained. The independent variables in this study were instructional expenditure ratio divided into five categories: (a) below 57.49%, (b) 57.5-59.99%, (c) 60-62.49%, (d) 62.5-64.99%, and (e) 65% and higher. The quantitative dependent variables in this study were passing rates for each subject tested in the Texas Assessment of Knowledge and Skills (i.e., Reading, Mathematics, Science, Social Studies, and Writing) for students in poverty. Additionally, the research design of this investigation was consistent with the research design employed by Jones and Slate (2010, 2011) and Cullen et al. (2011, 2015b) who also explored differences in Texas instructional expenditure ratio and student achievement.

### **Participants and Instrumentation**

Participant data were selected from the Texas Education Agency Academic Excellence Indicator System database. This database is publicly accessible and contains archival data about Texas public school district instructional expenditures. Archival data were obtained for the 2006-2007, 2007-2008, 2008-2009, 2009-2010, and 2010-2011 school years for all Texas school districts.

The dependent variables in this investigation were the TAKS passing rates for the Reading, Mathematics, Science, Social Studies, and Writing exams for students in poverty. With respect to the independent variable in this investigation, instructional expenditure ratio was divided into six categories: (a) below 55%, (b) 55-57.49%, (c) 57.5-59.99%, (d) 60-62.49%, (e) 62.5-64.99%, and (f) 65% and higher. These instructional expenditure ratio groupings were used to determine the extent to which a better indicator than the mandated 65% instructional expenditure ratio when predicting student academic achievement could be obtained.

Five years of archival data from the 2006-2007, 2007-2008, 2008-2009,

2009-2010, and 2010-2011 school years were acquired on all school districts in Texas from the Texas Education Agency Academic Excellence Indicator System. By state law, the Texas Education Agency is required to report annually regarding instructional expenditure ratios for all school districts. Publicly accessible archival data were downloaded from the Texas Education Agency Academic Excellence Indicator System website into an Excel document. Data were then recoded and analyzed in the Statistical Package for the Social Sciences-Version 22.

## Results

A multivariate analysis of variance (MANOVA) statistical procedure was used to address the research questions previously delineated. Prior to conducting the MANOVA procedures, underlying assumptions were checked. Specifically examined was the extent to which the standardized skewness coefficients (i.e., the skewness value divided by its standard error) and the standardized kurtosis coefficients (i.e., the kurtosis value divided by its standard error) were within the boundaries of normality,  $\pm 3$  (Onwuegbuzie & Daniel, 2002). Following the determination of normality, Box's M Test of Equality of Covariance was calculated. Finally, the Levene's Test of Equality of Error Variances was conducted to ascertain if the assumption that the variability in overall difference was consistent within each dependent variable (i.e., TAKS Reading, Mathematics, Science, Social Studies, and Writing exams). Regardless of the extent to which the underlying assumptions of this multivariate procedure have been met, Field (2013) contends that the MANOVA procedure can withstand the violations of its underlying assumptions. Results of the statistical analyses that were conducted to determine the effect of instructional expenditure ratio grouping on the TAKS Reading, Math, Science, Social Studies, and Writing tests for students who were economically disadvantaged will now be described. Results will be presented in chronological order beginning with the 2006-2007 school year and concluding with the 2010-2011 school year.

With respect to the 2006-2007 school year, the MANOVA revealed a statistically significant overall difference, Wilks'  $\Lambda = .93$ ,  $p < .001$ , partial  $\eta^2 = .02$ , in TAKS passing rates as a function of instructional expenditure ratio for students in poverty. Using Cohen's (1988) criteria, the effect size was small. To determine specific TAKS tests on which differences might be present, univariate follow-up analysis of variance (ANOVA) procedures were calculated. The ANOVAs yielded statistically significant differences in passing rates on the TAKS Mathematics test,  $F(4, 805) = 4.70$ ,  $p = .001$ , partial  $\eta^2 = .02$ ; the TAKS Science test,  $F(4, 805) = 2.59$ ,  $p = .035$ , partial  $\eta^2 = .01$ ; and on the TAKS Writing test,  $F(4, 805) = 10.99$ ,  $p < .001$ , partial  $\eta^2 = .05$ . All effect sizes were small (Cohen, 1988). Statistically significant differences were not present in passing rates on the TAKS Reading test,  $F(4, 805) = 1.72$ ,  $p = .145$ , and the TAKS Social Studies test,  $F(4, 805) = 1.79$ ,  $p = .130$ . As such, passing rates on the TAKS Reading and Social Studies tests were commensurate across the categories.

Table 1. Descriptive Statistics on the TAKS Tests as a Function of School District Instructional Expenditure Ratios for the 2006-2007 School Year for Students in Poverty

<b>Instructional Expenditure Ratio Groupings</b>	<b>n of school districts</b>	<b>M</b>	<b>SD</b>
<i>Reading</i>			
Less than 57.49%	84	84.50	6.65
57.5% to 59.99%	182	84.95	5.49
60.0% to 62.49%	224	85.29	4.83
62.5% to 64.99%	202	86.29	4.93
65% or Higher	118	86.29	4.93
<i>Mathematics</i>			
Less than 57.49%	84	68.60	11.27
57.5% to 59.99%	182	70.86	8.48
60.0% to 62.49%	224	71.94	7.86
62.5% to 64.99%	202	71.33	8.09
65% or Higher	118	73.58	7.60
<i>Science</i>			
Less than 57.49%	84	59.73	15.19
57.5% to 59.99%	182	62.59	11.88
60.0% to 62.49%	224	62.94	10.22
62.5% to 64.99%	202	62.71	10.56
65% or Higher	118	64.92	10.64
<i>Social Studies</i>			
Less than 57.49%	84	84.12	9.75
57.5% to 59.99%	182	83.29	7.55
60.0% to 62.49%	224	84.50	7.14
62.5% to 64.99%	202	84.10	6.60
65% or Higher	118	85.51	5.76
<i>Writing</i>			
Less than 57.49%	84	84.76	8.55
57.5% to 59.99%	182	87.66	6.96
60.0% to 62.49%	224	88.87	5.74
62.5% to 64.99%	202	89.35	5.06
65% or Higher	118	89.88	5.67

For the three statistically significant ANOVA results, post hoc procedures were calculated to determine which pairs of instructional expenditure ratio groups differed from each other. Scheffe` post hoc procedures revealed that in school districts with an instructional expenditure ratio of 60% or higher, the passing rates for students in poverty were more than 3% higher on the TAKS Mathematics test than school districts that had an instructional expenditure ratio of less than 60%. This passing percentage on the TAKS Mathematics test increased an additional 2.5% in school districts with an instructional expenditure ratio of 65% or higher than in school districts with an instructional expenditure ratio of less than 60%. The passing percentage on the TAKS Science test for students in poverty was more than 3% higher in schools districts with an instructional

expenditure ratio of 60% or higher than in school districts that spent less than 60% on instruction. Furthermore, school districts with an instructional expenditure ratio of 65% or higher had an increase in TAKS Science passing rates by more than 2% in comparison to school districts with an instructional expenditure ratio of 60% or less. On the TAKS Writing test, school districts with an instructional expenditure ratio that was in the range of 57.5% to 59.99 % had passing rates for students in poverty that were 3% higher than for school districts with an instructional expenditure ratio of 57.49% or less. Additionally, school districts that spent more than 60% on instruction had TAKS Writing passing rates at least 1% higher than school districts that spent less than 60% on instruction. Readers are referred to Table 1 for the descriptive statistics for students in poverty on the TAKS tests as a function of district instructional expenditure ratio for the 2006-2007 school year.

Concerning the 2007-2008 school year, the MANOVA revealed a statistically significant overall difference, Wilks'  $\Lambda = .91$ ,  $p < .001$ , partial  $\eta^2 = .02$ , in TAKS passing rates as a function of instructional expenditure ratio for students in poverty. Using Cohen's (1988) criteria, the effect size was small. Univariate follow-up ANOVA procedures yielded statistically significant differences in passing rates on the TAKS Reading test,  $F(4, 802) = 2.48$ ,  $p = .008$ , partial  $\eta^2 = .02$ ; TAKS Mathematics test,  $F(4, 802) = 12.47$ ,  $p < .001$ , partial  $\eta^2 = .06$ ; the TAKS Science test,  $F(4, 802) = 4.67$ ,  $p = .001$ , partial  $\eta^2 = .02$ ; and on the TAKS Writing test,  $F(4, 802) = 3.54$ ,  $p = .007$ , partial  $\eta^2 = .02$ . Effect sizes were small for the Reading, Science, and Writing tests and was moderate for the Mathematics test (Cohen, 1988). Statistically significant differences were not present in passing rates on the TAKS Social Studies test,  $F(4, 802) = 2.13$ ,  $p = .076$ .

Post hoc procedures were next calculated to determine which pairs of instructional expenditure ratio groups differed from each other. Scheffe` post hoc procedures revealed that the passing rates for students in poverty on the TAKS Reading test increased by 1.5% in school districts with an instructional expenditure ratio of 62.5% or greater in comparison to school districts with an instructional expenditure ratio of 62.49% or less. For the TAKS Mathematics test, passing rates for students in poverty increased more than 5% in school districts with an instructional expenditure ratio of 57.5% or higher in comparison to school districts with less than 57.49% on instruction. Similarly, passing rates on the TAKS Science test for students in poverty was 4.2% higher in school districts with an instructional expenditure ratio of 57.5% or higher than for school districts with an instructional expenditure ratio of less than 57.49%. Passing rates for students in poverty on the TAKS Writing test were at least 1% higher in school districts with an instructional expenditure ratio of 62.5% in comparison to school districts with 62.49% or less on instruction. Readers are referred to Table 2 for the descriptive statistics for students in poverty on the TAKS tests as a function of district instructional expenditure ratio for the 2007-2008 school year.

Table 2. Descriptive Statistics on the TAKS Tests as a Function of School District Instructional Expenditure Ratios for the 2007-2008 School Year for Students in Poverty

<b>Instructional Expenditure Ratio Groupings</b>	<b>n of school districts</b>	<b>M</b>	<b>SD</b>
<i>Reading</i>			
Less than 57.49%	94	86.50	6.41
57.5% to 59.99%	163	87.94	4.70
60.0% to 62.49%	246	87.57	4.79
62.5% to 64.99%	193	88.67	4.27
65% or Higher	111	88.01	4.50
<i>Mathematics</i>			
Less than 57.49%	94	69.51	9.82
57.5% to 59.99%	163	74.99	7.77
60.0% to 62.49%	246	74.53	7.91
62.5% to 64.99%	193	76.22	7.95
65% or Higher	111	76.12	7.09
<i>Science</i>			
Less than 57.49%	94	60.86	11.42
57.5% to 59.99%	163	65.11	9.61
60.0% to 62.49%	246	63.65	9.05
62.5% to 64.99%	193	65.38	9.36
65% or Higher	111	65.45	8.96
<i>Social Studies</i>			
Less than 57.49%	94	85.36	6.79
57.5% to 59.99%	163	85.97	7.04
60.0% to 62.49%	246	86.75	6.09
62.5% to 64.99%	193	86.94	5.95
65% or Higher	111	87.52	5.26
<i>Writing</i>			
Less than 57.49%	94	87.78	8.02
57.5% to 59.99%	163	89.00	7.16
60.0% to 62.49%	246	89.65	6.04
62.5% to 64.99%	193	90.13	5.86
65% or Higher	111	90.72	4.42

Regarding the 2008-2009 school year, the MANOVA revealed a statistically significant overall difference, Wilks'  $\Lambda = .92$ ,  $p < .001$ , partial  $\eta^2 = .02$ , in TAKS passing rates as a function of instructional expenditure ratio for students in poverty. Using Cohen's (1988) criteria, the effect size was small. Univariate follow-up ANOVA procedures yielded statistically significant differences in passing rates on the TAKS Reading test,  $F(4, 808) = 3.32$ ,  $p = .01$ , partial  $\eta^2 = .02$ ; TAKS Mathematics test,  $F(4, 808) = 8.80$ ,  $p < .001$ , partial  $\eta^2 = .04$ ; the TAKS Science test,  $F(4, 808) = 4.54$ ,  $p = .001$ , partial  $\eta^2 = .02$ ; the TAKS Social Studies test,  $F(4, 808) = 3.79$ ,  $p = .005$ , partial  $\eta^2 = .02$ ; and on the TAKS Writing test,  $F(4, 808) = 10.40$ ,  $p < .001$ , partial  $\eta^2 = .05$ . All effect sizes were small (Cohen, 1988).

Table 3. Descriptive Statistics on the TAKS Tests as a Function of School District Instructional Expenditure Ratios for the 2008-2009 School Year for Students in Poverty

<b>Instructional Expenditure Ratio Groupings</b>	<b>n of School Districts</b>	<b>M</b>	<b>SD</b>
<i>Reading</i>			
Less than 57.49%	84	86.62	7.14
57.5% to 59.99%	156	87.43	5.36
60.0% to 62.49%	251	88.08	4.66
62.5% to 64.99%	203	88.20	4.33
65% or Higher	119	88.93	3.81
<i>Mathematics</i>			
Less than 57.49%	84	71.74	11.67
57.5% to 59.99%	156	75.69	8.48
60.0% to 62.49%	251	76.43	7.38
62.5% to 64.99%	203	76.78	7.51
65% or Higher	119	78.30	7.03
<i>Science</i>			
Less than 57.49%	84	66.00	12.72
57.5% to 59.99%	156	67.69	10.08
60.0% to 62.49%	251	68.86	9.52
62.5% to 64.99%	203	69.46	8.87
65% or Higher	119	71.38	8.82
<i>Social Studies</i>			
Less than 57.49%	84	87.40	7.32
57.5% to 59.99%	156	88.12	6.74
60.0% to 62.49%	251	89.12	5.51
62.5% to 64.99%	203	89.05	4.99
65% or Higher	119	90.18	4.31
<i>Writing</i>			
Less than 57.49%	84	86.83	9.92
57.5% to 59.99%	156	87.46	7.49
60.0% to 62.49%	251	89.93	5.48
62.5% to 64.99%	203	89.69	6.82
65% or Higher	119	91.63	3.62

Next, post hoc procedures were calculated to ascertain which pairs of instructional expenditure ratio groups differed from each other. Scheffe` post hoc procedures revealed that students in poverty had passing rates up to 1.5% higher on the TAKS Reading test in school districts with an instructional expenditure ratio of 60% or higher than for school districts with 59.99% or less on instruction. Passing rates for students in poverty were 2.5% higher on the TAKS Mathematics test in school districts with an instructional expenditure ratio of 60% or more in comparison to school districts with an instructional expenditure ratio below 60%. Similarly, passing rates on the TAKS Science and Social Studies tests for students in poverty also increased by approximately 2% in school districts with an instructional expenditure ratio of at least 65%. In addition, the passing rate on

the TAKS Writing test for students in poverty was nearly 3% higher in school districts with an instructional expenditure ratio of at least 60% in comparison to school districts with an instructional expenditure ratio of less than 60%. Table 3 contains the descriptive statistics for students who were economically disadvantaged on the TAKS tests as a function of district instructional expenditure ratio for the 2008-2009 school year.

Pertaining to the 2009-2010 school year, the MANOVA revealed a statistically significant overall difference, Wilks'  $\Lambda = .92$ ,  $p < .001$ , partial  $\eta^2 = .02$ , in TAKS passing rates as a function of instructional expenditure ratio for students in poverty. Using Cohen's (1988) criteria, the effect size was small. Univariate follow-up ANOVA procedures yielded statistically significant differences in passing rates on the TAKS Reading test,  $F(4, 798) = 4.88$ ,  $p = .001$ , partial  $\eta^2 = .02$ ; TAKS Mathematics test,  $F(4, 798) = 10.56$ ,  $p < .001$ , partial  $\eta^2 = .05$ ; the TAKS Science test,  $F(4, 798) = 2.86$ ,  $p = .023$ , partial  $\eta^2 = .01$ ; the TAKS Social Studies test,  $F(4, 798) = 4.47$ ,  $p = .001$ , partial  $\eta^2 = .02$ ; and on the TAKS Writing test,  $F(4, 798) = 9.17$ ,  $p < .001$ , partial  $\eta^2 = .04$ . All effect sizes were small (Cohen, 1988).

Post hoc procedures were next calculated to determine which pairs of instructional expenditure ratio groups differed from each other. Scheffe` post hoc procedures revealed that students in poverty had passing rates of at least 2% higher on the TAKS Reading test in school districts with an instructional expenditure ratio of 60% or more in comparison to school districts with an instructional expenditure ratio less than 57.49%. Students in poverty also had passing rates that were nearly 2% higher on the TAKS Mathematics test in school districts with an instructional expenditure ratio of at least 60% in comparison to school districts that spent 59.99% or less. School districts with an instructional expenditure ratio of 65% or higher had an increase of 1.6% and 1.1% in passing rates for students in poverty on the TAKS Science and Social Studies tests, respectively, than for school districts that spent less than 65% on instruction. Additionally, the passing rates for students in poverty on the TAKS Writing test increased by more than 2% in school districts with an instructional expenditure ratio of at least 60% in comparison to school districts with an instructional expenditure ratio of less than 57.49%. Revealed in Table 4 for the descriptive statistics for students who were economically disadvantaged on the TAKS tests as a function of district instructional expenditure ratio for the 2009-2010 school year.

Table 4. Descriptive Statistics on the TAKS Tests as a Function of School District Instructional Expenditure Ratios for the 2009-2010 School Year for Students in Poverty

<b>Instructional Expenditure Ratio Groupings</b>	<b>n of School Districts</b>	<b>M</b>	<b>SD</b>
<i>Reading</i>			
Less than 57.49%	92	84.78	6.56
57.5% to 59.99%	128	85.91	4.92
60.0% to 62.49%	218	86.83	4.77
62.5% to 64.99%	214	86.70	4.65
65% or Higher	151	87.36	3.91
<i>Mathematics</i>			
Less than 57.49%	92	73.80	10.29
57.5% to 59.99%	128	76.66	7.21
60.0% to 62.49%	218	78.40	7.25
62.5% to 64.99%	214	78.65	7.06
65% or Higher	151	79.54	6.11
<i>Science</i>			
Less than 57.49%	92	73.66	11.26
57.5% to 59.99%	128	75.42	9.37
60.0% to 62.49%	218	76.13	7.84
62.5% to 64.99%	214	76.47	7.25
65% or Higher	151	77.04	6.21
<i>Social Studies</i>			
Less than 57.49%	92	90.89	6.33
57.5% to 59.99%	128	92.14	4.41
60.0% to 62.49%	218	92.16	4.50
62.5% to 64.99%	214	92.56	4.10
65% or Higher	151	93.27	3.03
<i>Writing</i>			
Less than 57.49%	92	87.26	8.22
57.5% to 59.99%	128	89.68	5.44
60.0% to 62.49%	218	89.45	5.77
62.5% to 64.99%	214	90.15	5.00
65% or Higher	151	91.60	3.88

With regard to the 2010-2011 school year, the MANOVA revealed a statistically significant overall difference, Wilks'  $\Lambda = .93$ ,  $p < .001$ , partial  $\eta^2 = .02$ , in TAKS passing rates as a function of instructional expenditure ratio for students who were economically disadvantaged. Using Cohen's (1988) criteria, the effect size was small. Univariate follow-up analysis of variance procedures yielded statistically significant differences in passing rates on the TAKS Reading test,  $F(4, 841) = 4.39$ ,  $p = .002$ , partial  $\eta^2 = .02$ ; TAKS Mathematics test,  $F(4, 841) = 12.71$ ,  $p < .001$ , partial  $\eta^2 = .06$ ; the TAKS Science test,  $F(4, 841) = 5.64$ ,  $p < .001$ , partial  $\eta^2 = .03$ ; TAKS Social Studies test,  $F(4, 841) = 4.67$ ,  $p = .001$ , partial  $\eta^2 = .02$ ; and on the TAKS Writing test,  $F(4, 841) = 4.16$ ,  $p = .002$ , partial  $\eta^2 = .02$ . Effect sizes were small for the Reading, Science, Social Studies and

Writing tests and was moderate for the Mathematics test (Cohen, 1988).

*Table 5. Descriptive Statistics on the TAKS Tests as a Function of School District Instructional Expenditure Ratios for the 2010-2011 School Year for Students in Poverty*

<b>Instructional Expenditure Ratio Groupings</b>	<b><i>n</i> of School Districts</b>	<b>M</b>	<b>SD</b>
<i>Reading</i>			
Less than 57.49%	94	84.31	6.07
57.5% to 59.99%	126	85.56	5.79
60.0% to 62.49%	222	86.09	5.59
62.5% to 64.99%	225	86.69	4.58
65% or Higher	179	86.66	4.45
<i>Mathematics</i>			
Less than 57.49%	94	74.09	9.22
57.5% to 59.99%	126	77.68	8.90
60.0% to 62.49%	222	78.70	7.24
62.5% to 64.99%	225	79.95	6.29
65% or Higher	179	80.03	6.72
<i>Science</i>			
Less than 57.49%	94	72.71	12.04
57.5% to 59.99%	126	75.41	9.53
60.0% to 62.49%	222	76.06	8.49
62.5% to 64.99%	225	76.77	7.10
65% or Higher	179	77.53	6.63
<i>Social Studies</i>			
Less than 57.49%	94	90.24	6.62
57.5% to 59.99%	126	91.25	5.60
60.0% to 62.49%	222	91.41	5.24
62.5% to 64.99%	225	92.20	3.94
65% or Higher	179	92.58	3.41
<i>Writing</i>			
Less than 57.49%	94	86.03	8.64
57.5% to 59.99%	126	87.11	6.88
60.0% to 62.49%	222	87.95	7.01
62.5% to 64.99%	225	88.42	5.65
65% or Higher	179	89.08	5.34

Post hoc procedures were next calculated to determine which pairs of instructional expenditure ratio groups differed from each other. Scheffe` post hoc procedures revealed that students in poverty had passing rates of at least 1% higher on the TAKS Reading test in school districts with an instructional expenditure ratio of 62.5% or more in comparison to school districts with an instructional expenditure ratio less than 62.49%. Students in poverty also had passing rates that were 1.2% higher on the TAKS Mathematics test in school districts with an instructional expenditure ratio of at least 62.5% in comparison to school districts that spent 62.49% or less. School districts with an instructional

expenditure ratio of 65% or higher had an increase of 2.1% and 1.3% in passing rates for students in poverty on the TAKS Science and Social Studies tests, respectively, than for school districts that spent less than 60% on instruction. Additionally, passing rates for students in poverty on the TAKS Writing test increased by 1.3% in school districts with an instructional expenditure ratio of at least 62.5% in comparison to school districts with an instructional expenditure ratio of less than 62.49%. Table 5 contains the descriptive statistics for students who were economically disadvantaged on the TAKS tests as a function of district instructional expenditure ratio for the 2010-2011 school year.

### Discussion

Each year school districts are held accountable for meeting and exceeding minimum student academic achievement standards while continually facing limited financial resources and decreases in funding. In Texas, the state of interest in this study, the percentage of students who are growing up in poverty continues to increase (Texas Education Agency Academic Excellence Indicator System Report, 2003; Texas Education Agency Texas Academic Performance Report, 2014). This situation in Texas has created an urgent need to examine efficient methods of allocating financial resources for student success. Delineated in Table 6 are the percentages of students who were economically disadvantaged in Texas for the 2006-2007 through the 2010-2011 school years (Texas Education Agency Academic Excellence Indicator System Report, 2007, 2008, 2009, 2010, 2011).

*Table 6.* Number and Percentage of Students who were Economically Disadvantaged in Texas by School Year

School Year	Number of Students in Poverty	Percentage of Students in Poverty
2006-2007	2,540,888	55.5%
2007-2008	2,572,093	55.3%
2008-2009	2,681,474	56.7%
2009-2010	2,848,067	59.0%
2010-2011	2,909,554	59.2%

The extent to which differences were present in the passing rates on the TAKS Reading, Mathematics, Science, Social Studies, and Writing tests as a function of instructional expenditure ratio for students in poverty was examined in this investigation. In each of the five school years of data analyzed, statistically significant results were present. Following these statistical analyses, the presence of trends for the five TAKS tests for students in poverty as a function of instructional expenditure ratio was determined.

Table 7. Summary of Effect Sizes on the TAKS Tests as a Function of School District Instructional Expenditure Ratios for the 2006-2007 through the 2010-2011 School Years for Students in Poverty

TAKS Test	Partial Eta Squared	Range	Lowest Performance
<i>Reading</i>			
2006-2007	N/A	N/A	N/A
2007-2008	.017	Small	<57.49% IER
2008-2009	.016	Small	<57.49% IER
2009-2010	.024	Small	<57.49% IER
2010-2011	.020	Small	<57.49% IER
<i>Mathematics</i>			
2006-2007	.023	Small	<57.49% IER
2007-2008	.059	Moderate	<57.49% IER
2008-2009	.042	Small	<57.49% IER
2009-2010	.050	Small	<57.49% IER
2010-2011	.057	Moderate	<57.49% IER
<i>Science</i>			
2006-2007	.013	Small	<57.49% IER
2007-2008	.023	Small	<57.49% IER
2008-2009	.022	Small	<57.49% IER
2009-2010	.014	Small	<57.49% IER
2010-2011	.026	Small	<57.49% IER
<i>Social Studies</i>			
2006-2007	N/A	N/A	N/A
2007-2008	N/A	N/A	N/A
2008-2009	.018	Small	<57.49% IER
2009-2010	.022	Small	<57.49% IER
2010-2011	.022	Small	<57.49% IER
<i>Writing</i>			
2006-2007	.052	Small	<57.49% IER
2007-2008	.017	Small	<57.49% IER
2008-2009	.049	Small	<57.49% IER
2009-2010	.044	Small	<57.49% IER
2010-2011	.019	Small	<57.49% IER

In this study, the presence of statistically significant differences were documented for school districts that had a 60% or higher instructional expenditure ratio in passing rates for students in poverty on the TAKS Reading, Mathematics, Science, Social Studies, and Writing tests. As the percentage of instructional expenditure ratio for school districts increased, the passing rates for students in poverty on all of the TAKS tests also increased. To determine the magnitude of the difference between the TAKS passing rates for students in poverty, partial eta squared effect sizes were calculated for each school. The assortment of the partial eta squared calculations was from a low of .013 to a high of .059, and the range was .046 for the five years of data analyzed. Calculations were higher in the 2009-2011 school years, with an average of .03, than in the 2006-2008 school years, which had an average of .02. Readers are referred to Table 7 for

the partial eta squared effect size calculations. A beneficial benchmark for school districts may exist at the 60% instructional expenditure level to improve student academic achievement as indicated by the passing rates on the TAKS Reading, Mathematics, Science, Social Studies, and Writing tests. It is evident that the responsibility of educating students in poverty is complex. However, financial allocations by school districts clearly influence student achievement. To sum it up, money does matter.

### **Implications for Policy and Practice**

School districts face increasingly arduous financial challenges as student academic achievement standards are rising and funds are simultaneously being reduced. In addition, students growing up in poverty must tackle bigger challenges to improve academic performance and school districts with large populations of students in poverty have even greater academic hurdles to jump. Purposeful decisions regarding financial policy are imperative to close any achievement gaps that exist. Texas courts have long been tasked with the grueling dilemma of providing school financial equity and adequacy through fair policy adoption. Funding formulas will likely need to be overhauled to close current funding gaps.

Improved achievement results for students could possibly be attained if thoughtful assignment of financial resources were adjusted or clarified. Flexibility for funding allocations for school districts should be encouraged, provided accountability systems are in place and desired results are achieved. Schools and school districts should examine best practices and determine what constitutes improved academic performance for students.

### **Recommendations for Future Research**

Examined in this study was the effect of instructional expenditure ratio grouping on the TAKS Reading, Mathematics, Science, Social Studies, and Writing test passing rates for students who were economically disadvantaged. Results acquired from this investigation might be used as a foundation for future researchers to extend this study by obtaining and examining dropout rate, completion rate, college readiness, and advanced course completion for students who were economically disadvantaged. Students who do not receive a high school diploma or are not academically prepared for post-secondary education could face limited opportunities in the future. Another suggestion for research related to students in poverty is to examine individual student financial data including school district instructional expenditures allocated per student. Per pupil financial allocations by school districts may influence student academic performance. In addition, research is needed to determine if actual monies spent by school districts in specific categories within the instructional expenditure ratio umbrella have an impact on student academic achievement. Data from the STAAR tests were not

considered for this investigation due to the inconsistencies with state testing from the 2011-2012 through the 2014-2015 school years. However, valid and valuable data obtained from future STAAR assessments can be interpreted to determine whether statistically significant results continue to exist for students in poverty.

### Conclusion

The purpose of this research study was to determine the effect of instructional expenditure ratio grouping on the TAKS Reading, Mathematics, Science, Social Studies, and Writing tests for students who were economically disadvantaged. After obtaining and analyzing five school years of Texas statewide data, statistically significant differences were revealed in the academic achievement of students who were economically disadvantaged. In each school year between 2006-2007 and 2010-2011, as instructional expenditure ratios for school districts increased, the passing rates for students in poverty on all of the TAKS tests also increased. School districts should strive for at least the 60% instructional expenditure level to improve student academic achievement. The responsibility of educating students in poverty is multifaceted and financial allocations by school districts noticeably have an impact on student success.

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