Journal of Educational System
Volume 2, Issue 4, 2018, PP 33-37
ISSN 2637-5877

Differences between Charter and Traditional Elementary Schools in Grade 3 Mathematics Performance

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ABSTRACT

Examined in this study was the degree to which differences were present in Grade 3 student mathematics performance between charter elementary schools and traditional elementary schools in Texas. Archival data were obtained on the State of Texas Assessments of Academic Readiness (STAAR) Mathematics test scores for the 2015-2016 school year. Inferential statistical analyses of the STAAR Mathematics Level II: Satisfactory Academic Performance and Level III: Advanced Academic Performance indicators yielded the presence of statistically significant differences. Traditional elementary schools had statistically significantly higher percentages of their Grade 3 students who met both of these performance indicators than did charter schools. Recommendations for future research and implications of these results are provided.

Keywords: *charter elementary schools, traditional elementary schools, performance indicators, STAAR. Grade 3 mathematics*

INTRODUCTION

Across the United States, parents of school-age children are faced with choices that were not available several decades ago (Campbell, Heyward, & Gross, 2017). School choice is a relatively new term in which parents are provided an option for their children's educational setting. Because of this new option, competition between traditional public schools and charter schools may arise. Predicted in some education reform models (Hess, 2004) is that this competition will increase the rigor and strengthen instructional practices within public schools. In contrast, other scholars (e.g., Davis, 2013) have argued that the competition between traditional public schools and charter schools will not be likely to bring about major academic improvements in the public school system.

Charter schools have emerged and have gained support, both ideologically and financially, from federal and state policy. Texas implemented charter schools when the state received a federal charter school grant in 2007 (Texas Education Agency, 2011). By the 2014-2015 school year, Texas had 689 charter schools that served over 230,000 students (Montemayor, 2017). As charter schools continue to increase in numbers, so do the issues between charter schools and traditional public schools. Controversy surrounding the competition between public schools and charter schools stem from issues such as attendance, loss of funding, and overall academic performance. Debates have emerged on the political front as well as within education professional groups concerning whether students are receiving equally high standards of education at charter schools and traditional public schools (Barden & Lassmann, 2016). As a result of these disputes, several studies have been completed in which charter schools and traditional public schools were compared.

Montemayor (2017) conducted a quantitative, comparative analysis on the reading and mathematics performance of students in Grades 3, 4, and 5. Montemayor (2017) specifically analyzed the state-mandated assessments in reading and mathematics of students in South Texas in the 2015-2016 school year. Similar reading and mathematics test scores were present for students in charter elementary schools and traditional elementary schools. As such, students in charter schools did not have higher reading and mathematics test scores than students who were enrolled in traditional elementary schools

In another statewide, multiyear investigation, Benson (2012) analyzed the reading performance of students in open-enrollment elementary charter schools and traditional elementary public schools. Benson (2012) documented that students in Grades 3 and 4 who were enrolled in traditional elementary public

schools had statistically significantly higher reading and mathematics test scores than their counterparts who were enrolled in open-enrollment elementary charter schools.

A recent investigation in which charter elementary schools were compared to traditional elementary schools was conducted by Escalante and Slate (2017). They analyzed the degree to which differences were present in the reading, writing, and science achievement of Grades 3, 4, and 5 students on the 2015 State of Texas Assessment of Academic Readiness (STAAR) tests between charter elementary schools and traditional elementary schools. Escalante and Slate (2017) documented that students enrolled in traditional elementary schools had statistically significantly higher scores on all three content areas than students enrolled in charter elementary schools. These results were consistent with Penning and Slate's (2011) study in which they established students enrolled in charter elementary schools do not perform academically higher than students enrolled in traditional elementary schools.

To date, much of the extant literature regarding charter schools and traditional schools in Texas has involved comparisons of reading performance. Only limited literature is available regarding mathematics performance. With the current educational trend of school choice and the opening of new charter schools each year, it is important to determine whether differences exist in mathematics achievement between charter elementary schools and traditional elementary schools.

Purpose of the Study

The purpose of this study was to determine the degree to which differences were present in mathematics achievement between Grade 3 students who were enrolled in charter elementary schools and Grade 3 students who were enrolled in traditional elementary schools in the State of Texas. The first comparison was on the Grade 3 STAAR Mathematics Level II Satisfactory Academic Performance between charter and traditional public schools. The second comparison involved the Grade 3 STAAR Mathematics Advanced Performance standard between charter and traditional public schools.

Significance of the Study

Given the intensity of public scrutiny on public schools and the push for charter schools and school choice, it is imperative to ensure that the institutions being pushed and funded are indeed providing a substantially better education than traditional schools. Little empirical evidence exists regarding the effectiveness of charter schools; therefore, a gap in the literature exists, especially in the realm of student academic achievement and performance levels on state assessments. The results of this study may be helpful to policymakers and educational leaders to compare the academic achievement in Grade 3 mathematics between charter schools and traditional schools.

Research Questions

The following questions were addressed in this study:

a. What is the difference between charter elementary schools and traditional elementary schools in student performance on the Grade 3 STAAR Mathematics for the Level II: Satisfactory Academic Performance standard?; and
b. What is the difference between charter elementary schools and traditional elementary schools in student performance on the Grade 3 STAAR Mathematics Level III: Advanced Academic Performance standard?

These research questions were addressed for the 2015-2016 school year.

Method

Research Design

A non-experimental, causal comparative research design (Creswell, 2014) was used for this study. Archival data were analyzed to examine the mathematics achievement of Grade 3 students who were enrolled in either charter elementary schools or in traditional elementary schools in the 2015-2016 school year. The independent variable in this research article was school type (i.e., charter elementary school, traditional elementary school), and the dependent variables were the STAAR Mathematics performance standards (i.e., Level II: Satisfactory Academic Performance and Level III: Advanced Performance) for Grade 3 students in the 2015-2016 school year. Because already existing data were analyzed, neither the independent variable of school type nor the dependent variables of the STAAR Mathematics test measures could be manipulated.

Participants

Participants in the study were students in Grade

3 who took the STAAR Mathematics assessment in the 2015-2016 school year. The total sample size on which data were analyzed was 395,319 students. Students enrolled in charter elementary schools comprised 17,652 of the population and students enrolled in traditional elementary schools included 377,667 students.

Instrumentation and Procedures

For the purpose of this study, archival data for the 2015-2016 school year for Grade 3 students who were enrolled in either a charter elementary school or a traditional public elementary school were analyzed. The mathematics performance of Grade 3 students during these school years was the specific information that was analyzed in this study. Grade 3 students were selected in this investigation because the third grade is the first year in which the STAAR Mathematics assessment is administered. Data were obtained from the Texas Education Agency Public Education Information Management System as a Statistical Package for Social Sciences datafile. The STAAR is considered a valid and reliable assessment. For technical information on the reliability and validity of the STAAR, readers are directed to the Texas Education Agency website https://tea.texas.gov/

CHARTER SCHOOLS

Charter schools are defined by the Texas Education Agency as a type of public schools. The Texas Legislature authorized the establishment of charter schools in 1995. Some of the first charters have been in operation since Fall 1996. Four types of charter schools exist in Texas:

1. Subchapter B Home-rule School District Charters - There are no home-rule school district charters in Texas.
2. Subchapter C Campus or Campus Program Charters - Independent school districts authorize and oversee these charters.
3. Subchapter D Open-enrollment Charters - Most charters in Texas fall under this category. The commissioner authorizes these charters. Before SB 2 passed in 2013, the State Board of Education (SBOE) was the authorizer.
4. Subchapter E University or Junior College Charters - The commissioner authorizes Subchapter E charters. Eligible entities include public colleges and universities.

Charter schools are subject to fewer state laws than other public schools; however, the state monitors and accredits charter schools just as the state accredits school districts (Texas Education Agency, Charter Schools, 2017a, para. 1). The reduced legislation is believed to encourage more innovation and to allow for more flexibility, though state law does require fiscal and academic accountability from charter schools.

Level II: Satisfactory Academic Performance

Level II: Satisfactory Academic Performance refers to the label given to students who are prepared for the next grade level. These students may require little or no academic interventions (Texas Education Agency, 2016d, chapter 4, p. 26).

Level III Advanced Performance

Level III: Advanced Academic Performance refers to the label given to students who are well-prepared for the next grade level and who have a high likelihood of success with little intervention (Texas Education Agency, 2016d, Chapter 4, p. 26).

RESULTS

To ascertain whether statistically significant differences were present in passing standards (i.e., Level II: Satisfactory and Level III: Advanced) between charter elementary schools and traditional elementary schools in Grade 3 mathematics, Pearson chi-square analyses were conducted. This statistical procedure was viewed as the optimal statistical procedure to use because frequency data were present for both passing standards and for elementary school type. As such, chi-squares are the statistical procedure of choice when both variables are categorical (Slate & Rojas-LeBouef, 2011). In addition, with the large sample size, the available sample size per cell was more than five. Therefore, the assumptions for utilizing a chi-square were met.

For the first research question in which the focus was placed on the Level II: Satisfactory Academic Performance standard between charter schools and traditional schools, the result was statistically significant, $\chi^2(1) = 202.88$, $p < .001$. The effect size for this finding, Cramer's V, was below small, .018 (Cohen, 1988). As revealed in Table 1, traditional elementary schools had a statistically significantly higher percentage of their Grade 3 students who met the STAAR Mathematics Level II: Satisfactory Academic Performance standard than charter

elementary schools. Traditional elementary schools surpassed elementary charter schools on this Level II: Satisfactory Academic Performance standard by approximately 5%.

Table1. *Frequencies and Percentages of Grade 3 Mathematics Level II: Satisfactory Academic Performance by Elementary School Type*

School Type	Met Standard n and % of Total	Did Not Meet Standard n and % of Total
Charter	(n = 6,502) 36.83%	(n = 11,150) 63.16%
Traditional	(n = 159,557) 42.45%	(n = 218,110) 57.75%

For the second research question in which the Level III: Advanced Academic Performance standard was analyzed, the result was statistically significant, $\chi^2(1) = 134.49$, $p < .001$. The effect size for this finding, Cramer's V, was below small, .023 (Cohen, 1988). As presented in Table 2, traditional elementary schools had a higher percentage of Grade 3 students who met the STAAR Mathematics Level III: Advanced Academic Performance standard than elementary charter schools. Traditional schools had 3.47% more students who met this performance level on the Grade 3 STAAR Mathematics test than elementary charter schools.

Table2. *Frequencies and Percentages of Grade 3 Mathematics Level III: Advanced Academic Performance by Elementary School Type*

School Type	Met Standard n and % of Total	Did Not Meet Standard n and % of Total
Charter	(*n* = 2,687) 15.22%	(*n* = 14,965) 84.78%
Traditional	(*n* = 70,595) 18.69%	(*n* = 307,072) 81.31%

DISCUSSION

In this study, the degree to which differences were present in Grade 3 mathematics performance between students enrolled in charter elementary schools and students enrolled in traditional elementary schools for the 2015-2016 school year was examined. Inferential statistical analyses revealed that statistically significantly higher percentages of Grade 3 students who were enrolled in traditional elementary schools met both passing standards analyzed, Level II: Satisfactory Academic Performance and Level III: Advanced Academic Performance, than Grade 3 students who were enrolled in charter schools in Texas. These results are consistent with past studies by Escalante and Slate (2017) who determined that Grade 3 students who were enrolled in traditional elementary schools had statistically significantly higher reading test scores than did their peers who were enrolled in charter elementary schools. Similarly, Penning and Slate (2011) documented that students who were enrolled in charter schools were not performing better than students who were enrolled in traditional public schools.

The State of Texas's legislative planning estimate for the 2017-2018 school year for funding of charter schools was $2,557,548,477.00. The debate continues on whether or not the funds that are put into charter schools is yielding the results of a better education for students in the state of Texas. The results of this study for Grade 3 mathematics would not support the continuation of funding charter school programs without further investigation and analysis. Grade 3 students who were enrolled in charter elementary schools in Texas clearly did not have higher or even equal mathematics performance with Grade 3 students who were enrolled in traditional elementary schools.

No attempt was made in this study to examine why the differences were present between charter elementary schools and traditional elementary schools Grade 3 mathematics passing standards. As such, researchers are encouraged to examine in more detail the differences present in instructional practices between these two school types. Researchers are also encouraged to conduct comparisons between these two school types at other grade levels. The extent to which findings delineated herein on only Grade 3 students would be generalizable to charter schools at the middle school or at the high school level is not known. Moreover, academic areas other than reading and mathematics should be analyzed. A final suggestions for future research would be to conduct comparisons of charter schools with traditional schools in other states.

CONCLUSION

In conclusion, no evidence was obtained regarding the efficacy of charter elementary schools in comparison to traditional elementary schools. Although the current political headwinds are dramatically in favor of charter schools, the evidence is clearly lacking that

charter schools are better than traditional schools. The evidence to date, at least in reference to Texas, supports the efficacy of traditional schools over charter schools. Perhaps policymakers and educational leaders might examine the research literature prior to being advocates for a school choice option (i.e., charter schools) that is not a superior one to traditional schools.

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Citation: *Beth Klammer and John R. Slate. "Differences between Charter and Traditional Elementary Schools in Grade 3 Mathematics Performance" Journal of Educational System, 2(4), 2018, pp. 33-37.*