

DIFFERENTIATING CHARTER FROM NON-CHARTER SCHOOLS: A STATEWIDE INVESTIGATION

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Abstract: In this study, the extent to which charter schools could be differentiated from non-charter elementary, middle, and high schools in Texas was investigated. Statewide archival data from the Texas Education Agency Academic Excellence Indicator System were obtained on all Texas public schools, charter and non-charter, for the 2010-2011 school year. Canonical stepwise discriminant analyses were conducted to determine whether specific school characteristics (i.e., Percent of Full-Time Beginning Teachers, Percent of Black Student Enrollment, Percent of Student Enrollment Who Were Economically Disadvantaged, Mobility Rate, Percent of Disciplinary Alternative Education Program Placements, Percent of Hispanic Student Enrollment, Percent of Bilingual/English Enrollment, Percent of Limited English Proficient Student Enrollment, and Percent of Students Who Were At-Risk) could differentiate charter from non-charter schools at each campus level. All three canonical stepwise discriminant function analyses were statistically significant. The canonical functions provided strong differentiation in the school characteristics between charter and non-charter schools at the elementary, middle, and high school levels. Of interest is that the school characteristic that most strongly discriminated between charter and non-charter schools was the percentage of full-time beginning teachers. Implications of our results are discussed.

Keywords: Beginning teachers, charter, elementary, middle and high schools.

Differentiating Charter From Non-Charter Schools: A Statewide Investigation

With the passage of the No Child Left Behind Act of 2001 (2002), Texas school administrators are mandated to address issues in low performing schools (Forte, 2010). Low performing schools are a major issue for school administrators because of the risk in meeting Annual Yearly Progress as mandated by the No Child Left Behind Act (Foley & Nelson, 2011). Additionally, schools are required to have teachers who are highly qualified as well as address concerns of teacher quality (Darling-Hammond & Sykes, 2003; 2002; Terry, 2010).

As required by the No Child Left Behind Act, the mandate for highly qualified teachers and the risk of not meeting Annual Yearly Progress requirements, teacher quality is a major priority for school administrators (Alliance For Excellent Education, 2004; Hanushek & Rivkin, 2010). As such, the provisions for accountability by the No Child Left Behind Act on schools for not meeting benchmarks provided an impetus for school administrators to seek out teachers who are highly qualified (Hanushek & Rivkin, 2010). A highly qualified teacher is described in the No Child Left Behind Act (2001) as having a bachelor's degree and a state certification with competencies in both teaching and subject skills (Phillips, 2010).

In Texas, charter schools face a growing concern relative to the quality of teachers they employed (Wei, Patel, & Young, 2014). As such, attracting high-quality teachers has been a challenge for school administrators (Sass, Flores, Claeys, & Perez, 2012). Additionally, issues of teacher attrition are a growing problem as administrators struggle to attract and retain high-quality teachers especially with the high number of beginning teachers in charter schools (Sass et al., 2012; Texas Association of School Boards, 2012; Wei et al., 2014). Moreover, researchers (Darling-Hammond & Sykes, 2003; Hanushek & Rivkin, 2010; Sass et al., 2012; Wei et al., 2014) reported high percentages of Hispanic and Black students in low performing charter schools suggesting the need for experienced high-quality teachers.

Statement of the Problem

America's educational system faces many challenges with providing experienced teachers in low performing schools (Darling-Hammond, 2008; Greenlee & Brown, 2009; Martinez-Garcia & Slate, 2012b). To a further extent, charter schools in Texas often employ teachers with less experience than teachers in non-charter schools (Texas Association of School Boards, n.d.; Wei et al., 2014, 2009). In Texas charter schools, new teachers

lack the proper preparation and induction to address the needs of low performing schools (Wei et al., 2014). Additionally, charter schools enroll a large percentage of Hispanic and Black students, as well as students who are economically disadvantaged (Kelly & Loveless, 2012; Penning & Slate, 2011; Texas Association of School Boards, 2009, 2012).

Significance of the Study

After an extensive review of the literature, studies in which the extent to which school characteristics and school types (i.e., charter and non-charter) correlated with school performance were limited. Researchers (Darling-Hammond, 2008; Greenlee & Brown, 2009; Martinez-Garcia & Slate, 2012) have suggested a relationship between beginning teachers and low performing schools existed and recommended further studies to reduce the gap in the literature. In this study, data from the 2010-2011 school year for Texas elementary, middle, and high school charter and non-charter schools were analyzed to contribute to the existing literature and encourage additional research concerning the characteristics of low performing schools.

Purpose of the Study

The purpose of this study was to determine the extent to which charter schools could be differentiated from non-charter elementary, middle, and high schools in Texas. A secondary purpose was to determine if the percentage of beginning teachers was higher in charter schools than in non-charter schools. By identifying which school characteristics discriminate between charter and non-charter schools continued importance of the relationship between percentage of beginning teachers and non-charter schools could be demonstrated.

Research Questions

The following research questions were addressed in this study: (a) What school characteristics best discriminate charter from non-charter elementary schools in Texas?; (b) What school characteristics best discriminate charter from non-charter middle schools in Texas?; and (c) What school characteristics best discriminate charter from non-charter high schools in Texas schools?

METHOD

Participants

Data from the Texas Education Agency Academic Excellence Indicator System for all traditional (K-5, 6-8, & 9-12) public elementary charter ($n_s > 150$), elementary non-charter ($n_s > 4,150$), middle charter ($n_s > 40$), middle non-charter ($n_s > 1,500$), high school charter ($n_s > 50$), and high school non-charter schools ($n_s > 1,000$) for the 2010-2011 school year in the State of Texas were utilized in this study. All non-traditional schools were excluded from this investigation due to their unique nature. Data for Texas charter and non-charter schools by campus level for each of the 10 school characteristics (i.e., percentages of beginning teachers, mobility rate, percentages of bilingual/ESL students, Black student percentages, Hispanic student percentages, percentages of students who were economically disadvantaged, percentages of Limited English Proficient students, percentages of students who were not economically disadvantaged, percentages of students who were in Disciplinary Alternative Education Programs, percentage of students labeled as being at-risk) were analyzed.

Instrumentation and Procedures

Archival data were downloaded from the Texas Education Agency Academic Excellence Indicator System website. Data were obtained on all Texas traditional K-12 public schools ($n_s > 6,900$) for the 2010-2011 school year. Data specific to school type (i.e., charter and non-charter), school characteristics were obtained. The Texas Education Agency (2014) defines a charter school as a public school that provides an educational facility for students in Texas through a charter that is contracted through a grant such as through the State Board of Education

RESULTS

Prior to conducting a canonical discriminant function analysis procedure, its underlying assumptions were checked. Regarding 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) for all three school levels (i.e., elementary, middle school, and high school), 42 of the 60 coefficients were not within the range of normality, $+/- 3$ (Onwuegbuzie & Daniel, 2002). The assumption for the Box's Test of Equality of Covariance was violated for all three school levels. Although the assumptions for Box's M were not met, the robustness of a discriminant analysis procedure made it appropriate to use on the data in this study (Field, 2009). Readers are referred to Tables 1 through 6 for the descriptive statistics for charter and non-charter schools by campus level.

Table 1

Descriptive Statistics for Elementary Charter Schools in Texas by School Characteristics

School Characteristics	M%	SD%
Beginning Teachers	28.36	29.32
Black Students	31.56	31.98
Students Not Economically Disadvantaged	24.72	26.21
Students Who Were Economically Disadvantaged	75.28	26.21
Mobility Rate	19.86	17.11
Students in Disciplinary Alternative Education Programs	0.00	0.00
Hispanic Students	49.27	33.70
Bilingual/English as a Secondary Language Students	22.36	25.58
Limited English Proficient Students	22.98	25.50
Students Who Were At-Risk	44.85	27.14

Table 2

Descriptive Statistics for Elementary Non-Charter Schools in Texas by School Characteristics

School Characteristics	M%	SD%
Beginning Teachers	3.54	4.91
Black Students	11.84	16.46
Students Not Economically Disadvantaged	34.02	26.60
Students Who Were Economically Disadvantaged	65.98	26.60
Mobility Rate	16.95	9.04
Students in Disciplinary Alternative Education Programs	0.23	0.98
Hispanic Students	51.54	30.70
Bilingual/English as a Secondary Language Students	22.74	21.40
Limited English Proficient Students	23.44	21.53
Students Who Were At-Risk	47.00	21.76

Table 3

Descriptive Statistics for Middle School Charter Schools in Texas by School Characteristics

School Characteristics	M%	SD%
Beginning Teachers	33.29	28.14
Black Students	25.89	29.18
Students Not Economically Disadvantaged	22.95	23.99
Students Who Were Economically Disadvantaged	77.04	23.99
Mobility Rate	21.04	18.53
Students in Disciplinary Alternative Education Programs	0.01	0.04
Hispanic Students	59.80	33.65
Bilingual/English as a Secondary Language Students	16.37	19.14
Limited English Proficient Students	16.60	18.57
Students Who Were At-Risk	41.49	21.84

Table 4

Descriptive Statistics for Middle School Non-Charter Schools in Texas by School Characteristics

School Characteristics	M%	SD%
Beginning Teachers	4.54	5.12
Black Students	12.16	15.79
Students Not Economically Disadvantaged	34.02	26.60
Students Who Were Economically Disadvantaged	66.00	26.60
Mobility Rate	16.95	9.04
Students in Disciplinary Alternative Education Programs	0.23	0.99
Hispanic Students	51.54	30.70
Bilingual/English as a Secondary Language Students	22.74	21.40
Limited English Proficient Students	23.44	21.53
Students Who Were At-Risk	47.00	21.76

Table 5

Descriptive Statistics for High School Charter Schools in Texas by School Characteristics

School Characteristics	M%	SD%
Beginning Teachers	21.80	21.36
Black Students	19.05	21.56
Students Not Economically Disadvantaged	29.48	25.98
Students Who Were Economically Disadvantaged	70.51	25.98
Mobility Rate	57.52	28.24
Students in Disciplinary Alternative Education Programs	0.10	0.60
Hispanic Students	53.04	30.35
Bilingual/English as a Secondary Language Students	5.76	10.70
Limited English Proficient Students	6.05	11.00
Students Who Were At-Risk	76.52	26.12

Table 6

Descriptive Statistics for High School Non-Charter Schools in Texas by School Characteristics

School Characteristics	M%	SD%
Beginning Teachers	4.62	6.43
Black Students	11.98	18.06
Students Not Economically Disadvantaged	45.36	25.59
Students Who Were Economically Disadvantaged	54.64	25.59
Mobility Rate	33.74	33.50
Students in Disciplinary Alternative Education Programs	5.06	11.08
Hispanic Students	43.80	31.20
Bilingual/English as a Secondary Language Students	4.50	9.36
Limited English Proficient Students	4.83	9.60
Students Who Were At-Risk	55.06	27.33

In this study a canonical stepwise discriminant function analysis was utilized to address all three research questions. Regarding the first research question, what school characteristics best differentiate charter from non-charter elementary schools in Texas, school type (i.e., charter and non-charter) was used as the grouping variable and 10 school characteristics (i.e., percentages of beginning teachers, mobility rates, percentages of bilingual/ESL students, Black student percentages, Hispanic student percentages, percentages of students who were economically disadvantaged, percentages of Limited English Proficient students, percentages of students who were not economically disadvantaged, percentages of students who were in Disciplinary Alternative Education Programs, percentages of students labeled as being at-risk) constituted discriminating variables. The canonical stepwise discriminant function analysis, used to discriminate elementary charter schools ($n = 162$) from non-charter schools ($n = 4,159$), was statistically significant, $\chi^2(5) = 1406.42$, $p < .001$ and accounted for 28% of the between-groups variance (canonical $R = .52$; Wilks' $\Lambda = .72$, $p < .001$). Group centroids relative to Texas elementary schools for charter and non-charter schools were 3.14 and -0.12 respectively, indicated that this function strongly differentiated between the two school types. The standardized discriminant function coefficients for the five statistically

significant school characteristics in this analysis were: Teacher Beginning Full Time Percentage (Standardized Coefficient = .90); percentage of Black students (Standardized Coefficient = .40); percentage of students who were in Disciplinary Alternative Education Programs (Standardized Coefficient = -.14); percentage of Hispanic students (Standardized Coefficient = .20); and percentage of students labeled as being At-risk (Standardized Coefficient = -.20). An examination of the standardized coefficients for these variables, using a cutoff coefficient of 0.3 (Lambert & Durand, 1975), indicated that two variables contributed most to the canonical function. The percentage of beginning full-time teachers and the percentage of Black student enrollment had the largest contribution to group differentiation. Readers are referred to Table 7 for these standardized coefficients. Readers are referred to Table 8 for a list of all 10 characteristics.

Table 7

Standardized Canonical Discriminant Coefficients by School Characteristics for Texas Elementary Schools K-5

School Characteristic	Coefficient
Beginning Teachers	0.90
Black Students	0.40
Students in Discipline Alternative Education Program	-0.14
Hispanic Students	0.20
Students Who Were At Risk	-0.20

Table 8

Pooled Within-Groups Correlations by School Characteristics for Texas Elementary Schools K-5

School Characteristic	Coefficient
Beginning Teachers	0.92
Black Students	0.38
Students Who Were Not Economically Disadvantaged	-0.14
Students Who Were Economically Disadvantaged	0.14
Mobility Rate	0.10
Students in Discipline Alternative Education Program	-0.08
Hispanic Students	-0.03
Bilingual/ESL Students	-0.03
Limited English Proficient Students	-0.02
Students Who Were At Risk	-0.02

Note. Limited English Proficient was not used in the analysis.

Regarding the second research question, the canonical stepwise discriminant function analysis used to discriminate middle school charter schools ($n = 45$) from non-charter schools ($n = 1,578$), was statistically significant, $\chi^2(7) = 478.34$, $p < .001$ and accounted for 26% of the between-groups variance (canonical $R = .50$; Wilks' $\Lambda = .74$, $p < .001$). Group centroids relative to Texas middle schools for charter and non-charter schools were 3.47 and -0.10 respectively, indicated that this function strongly differentiated between the two school types. The standardized discriminant function coefficients for the statistically significant school characteristics in this analysis were: Teacher Beginning Full Time Percentage (Standardized Coefficient = .87); percentage of Black students (Standardized Coefficient = .29); percentage of students who were in Disciplinary Alternative Education Programs (Standardized Coefficient = -.30); percentage of Hispanic students (Standardized Coefficient = .20); percentage of students labeled as being At-risk (Standardized Coefficient = -.37); and mobility rate (Standardized Coefficient = .22). An examination of the standardized coefficients for these variables, using a cutoff coefficient of 0.3 (Lambert & Durand, 1975), indicated that three school characteristics contributed most to the canonical function. The percentage of beginning full-time teachers, percentage of Black students, and mobility rate had the largest contribution. Readers are referred to Table 9 for the standardized coefficients. An examination of the pooled-within-groups correlations, using a cutoff of 0.3 (Lambert & Durand, 1975), revealed that one of the 10 discriminating variables (beginning full-time teachers), contributed to the canonical function. Readers are referred to Table 10 for a list all 10 characteristics.

Table 9

Standardized Canonical Discriminant Coefficients by School Characteristics for Texas Middle Schools 6-8

School Characteristic	Coefficient
Beginning Teachers	0.87
Black Students	0.29
Mobility Rate	0.30
Disciplinary Alternative Education Programs	-0.30
Hispanic Students	0.20
Bilingual/English as a Secondary Language Students	0.22
At-Risk Students	-0.37

Table 10

Pooled Within-Groups Correlations by School Characteristics for Texas Middle Schools 6-8

School Characteristic	Coefficient
Beginning Teachers	0.90
Black Students	0.30
Bilingual/English as a Secondary Language Students	0.22
Limited English Proficient Students	0.22
Students Not Economically Disadvantaged	-0.20
Students Who Were Economically Disadvantaged	0.20
Disciplinary Alternative Education Programs	-0.17
Mobility Rate	0.12
Hispanic Students	0.10
Students Who Were At-Risk	0.07

Note. Students who were economically disadvantaged were not used in the analysis.

Regarding the third research question, the canonical stepwise discriminant function analysis used to discriminate high school charter schools ($n = 100$) from non-charter schools ($n = 1,457$), was statistically significant, $\chi^2(5) = 638.04$, $p < .001$ and accounted for 34% of the between-groups variance (canonical $R = .59$; Wilks' $\Lambda = .66$, $p < .001$). Group centroids relative to Texas middle schools for charter and non-charter schools were 2.72 and -0.18 respectively, indicated that this function strongly differentiated between the two school types. The standardized discriminant function coefficients for the statistically significant school characteristics in this analysis were: Teacher Beginning Full Time Percentage (Standardized Coefficient = .87); percentage of Black students (Standardized Coefficient = .09); percentage of students who were in Disciplinary Alternative Education Programs (Standardized Coefficient = -.31); mobility rate (Standardized Coefficient = .52); and percentage of Limited English Proficient students (Standardized Coefficient = -.10). An examination of the standardized coefficients for these variables, using a cutoff coefficient of 0.3 (Lambert & Durand, 1975), indicated that three variables contributed most to the canonical function. The percentage of beginning full-time teachers, percentage of students who were in Disciplinary Alternative Education Programs, and mobility rate had the largest contribution. Readers are referred to Table 11 for the standardized coefficients. An examination of the pooled-within-groups correlations, using a cutoff of 0.3 (Lambert & Durand, 1975), revealed that three of the 10 discriminating variables (beginning full-time teachers, mobility risk, and students labeled as being at risk), contributed to the canonical function. Readers are referred to Table 12 for a list all 10 characteristics.

Table 11

Standardized Canonical Discriminant Coefficients by School Characteristics for Texas High Schools 9-12

School Characteristic	Coefficient
Beginning Teachers	0.88
Black Students	0.10
Students in Disciplinary Alternative Education Programs	-0.31
Mobility Rate	0.52
Limited English Proficient Students	-0.10

Table 12

Pooled Within-Groups Correlations by School Characteristics for Texas High Schools 9-12

School Characteristic	Coefficient
Beginning Teachers	0.83
Mobility Rate	0.36
Students Who Were At-Risk	0.30
Students in Disciplinary Alternative Education Programs	-0.19
Students Who Were Economically Disadvantaged	0.18
Students Who Were Not Economically Disadvantaged	-0.18
Black Students	0.16
Hispanic Students	0.04
Bilingual/English as a Secondary Language Students	-0.01
Limited English Proficient Students	-0.01

Note. Bilingual/English as a Secondary Language students were not used in the analysis.

Discussion

In this study, differences between charter and non-charter schools in Texas elementary, middle, and high school campuses were identified. Archival data were obtained on all Texas traditional K-12 public schools ($n_s > 6,900$) for the 2010-2011 school year. All three canonical stepwise discriminant function analyses used to discriminate charter from non-charter schools were statistically significant. An examination of the group centroids for all three campus levels indicated that the functions strongly differentiated between charter and non-charter schools. Of the 10 school characteristics, the percentage of beginning full-time teachers had the largest contribution to the canonical function.

A comparison of the percentage of beginning teachers indicated a higher percentage in charter schools as compared to non-charter schools. By campus level, a comparison of the percentage of beginning teacher in charter versus non-charter schools respectively were as followed: (a) elementary schools were 28% and 3%; (b) middle schools were 33% and 5%; and (c) high schools were 22% and 5%. Charter schools primarily attract beginning teachers and pay them very little, in part due to receiving little funding per student (Penning & Slate, 2011; Texas Association of School Boards, 2012; Wei et al., 2014). Researchers (Alliance for Excellent Education, 2004; Darling-Hammond, 2008; Greenlee & Brown, 2009; Martinez-Garcia & Slate, 2012) have indicated that statistically significant relationships are present between beginning teachers and low performing schools.

In light of the findings in this study, the high percentage of beginning teachers in Texas charter schools is congruent with prior studies in which researchers (Center for Research on Education Outcomes, 2009; Wei et al., 2014) indicated that charter schools, when compared to non-charter schools, did not perform as well. Additionally, low performing charter schools had a higher percentage of beginning teachers (Texas Association of School Boards, 2012; Wei et al., 2014) which aligns with the findings of this study. Further research into the extent to which the percentage of beginning teachers may correlate with low performing schools is warranted.

Recognition of the school characteristics that were determined to be highly discriminatory (i.e., percentage of beginning teachers, Black students, mobility rate, students in Disciplinary Alternative Education Programs, and students labeled as being At-risk) between charter and non-charter schools can allow administrators to be mindful when allocating proper resources and perhaps influence hiring practices. Addressing the deficiencies in staff development and support for new teachers may allow charter schools to improve their performance (Wei et al., 2014). A further analysis into how funding correlates with the low performance in charter schools is warranted in light of the fact that many low performing schools provided lower salaries as compared to non-charter schools (Texas Association of School Boards, 2012; Wei et al., 2014).

As with any empirical study, several limitations are present and need to be noted. First, our sample was limited to traditional schools (i.e., K-5, 6-8, & 9-12) excluding all other non-traditional schools. Second, data analyzed herein were limited to only the 2010-2011 school year. Third, accountability ratings were not considered in this study. As such, we recommend further research in which more years of statewide data were analyzed, as well as an examination of other variables such as accountability ratings. Until such time, we encourage readers to be cautious in the extent to which they make generalizations from our results.

References

- Center for Research on Education Outcomes. (2009). *Multiple choice: Charter school performance in 16 States*. Retrieved from http://credo.stanford.edu/reports/MULTIPLE_CHOICE_CREDO.pdf
- Darling-Hammond, L. (2008). A future worthy of teaching for America. *Phi Delta Kappan*, 89(10), 730-736.

- Darling-Hammond, L., & Sykes, G. (2003). Wanted: A national teacher supply policy for education: The right way to meet the "Highly Qualified Teacher" challenge. *Education Policy Analysis Archives, 11*(33). Retrieved from <http://epaa.asu.edu.ezproxy.shsu.edu/ojs/article/view/261/387>
- Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). Thousand Oaks, CA: Sage.
- Forte, E. (2010). Examining the assumptions underlying the NCLB Federal Accountability Policy on school improvement. *Educational Psychologist, 45*(2), 76-88. doi:10.1080/00461521003704738
- Greenlee, B., & Brown, J. (2009). Retaining teachers in challenging schools. *Education, 130*(1), 96-109.
- Hanushek, E., & Rivkin, S. (2010). The quality and distribution of teachers under the No Child Left Behind Act. *Journal of Economic Perspectives, 24*(3), 133-150. doi:10.1257/jep.24.3.133
- Kelly, A. P., & Loveless, T. (2012). Comparing new school effects in charter and traditional public schools. *American Journal of Education, 118*(4), 427-453.
- Lambert, Z. V., & Durand, R. M. (1975). Some precautions in using canonical analysis. *Journal of Market Research, XII*, 468-475.
- Martinez-Garcia, C., & Slate, J. R. (2012b). New high school teachers and accountability ratings: A five-year statewide study. *Journal of Education Research, 6*(3), 299-313.
- Onwuegbuzie, A. J., & Daniel, L. G. (2002). Uses and misuses of the correlation coefficient. *Research in the Schools, 9*(1), 73-90.
- Penning, F., & Slate, J. R. (2011). Charter schools in Texas: An overview. *International Journal of Educational Leadership Preparation, 6*(3), 1-9.
- Sass, D. A., Flores, B. B., Claeys, L., & Pérez, B. (2012). Identifying personal and contextual factors that contribute to attrition rates for Texas public school teachers. *Education Policy Analysis Archives, 20* (15), 1-25.
- Terry, K. (2010). We just can't seem to do what NCLB expects us to do: The case of an urban district focused on NCLB compliance. *Journal of Cases in Educational Leadership, 13*(1), 8-22.
- Texas Association of School Boards. (2012). *A comparison of TEA data: Open-enrollment charter schools vs. traditional school districts*. Retrieved from <https://www.tasb.org/Legislative/documents/lgibcomp>
- Texas Education Agency. (2014). *Charter schools*. Retrieved from http://tea.texas.gov/Texas_Schools/Charter_Schools/
- Wei, X., Patel, D., & Young, V. M. (2014). Opening the "black box": Organizational differences between charter schools and traditional public schools. *Education Policy Analysis Archives, 22*(3), 1-31. doi:10.14507/epaa.v22n3.2014