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Charter School Performance in Idaho
2019

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Table of Contents

Introduction	1
Study Approach	2
Idaho Charter School Landscape	6
Idaho Charter School Demographics	6
Analytic Findings of Charter School Impacts	10
Overall Charter School Impact on Student Progress	10
Charter School Impact by Growth Period	12
Charter School Impact by Students' Years of Enrollment	13
Charter School Impact by School Attribute	14
Charter School Impact by School Locale	14
Charter School Impact by School Grade Configuration	15
Charter School Impact by Delivery System	17
School-Level Analysis	20
The Range of School Quality	20
Growth and Achievement	22
Charter School Impacts by Student Subgroups	25
Charter School Impact for Students by Race/Ethnicity	25
Charter School Impact for Students in Poverty	31
Charter School Impact for Students in Poverty by Race/Ethnicity	33
Charter School Impact for English Language Learners	38
Charter School Impact for Special Education Students	40
Synthesis and Conclusions	43
APPENDICES	46
Appendix A: Sample Size in Each Subgroup	47
Appendix B: Technical Appendix	48
Source of Student-Level Data	48
Demographic Composition of Charter Students in the Study	48
Comparison of Starting Scores of Matched Students and VCRs	49
Measuring Academic Growth	50
Model for the Analysis of the Academic Impact of Charter Schools	51
Presentation of Results	52

Table of Figures

Figure 1: CREDO Virtual Control Record Methodology	4
Figure 2: Opened, Continuing, and Closed Charter Campuses, 2014-15 to 2016-17.....	6
Figure 3: Average Learning Gains in ID Charter Schools Compared to Gains for TPS VCRs	11
Figure 4: Average Learning Gains in ID Charter Schools Compared to Gains for VCR Students by Growth Period, 2015-2017.....	12
Figure 5: Average Learning Gains in ID Charter Schools Compared to Gains for VCR Students by Years in Charter	13
Figure 6: Average Learning Gains in ID Charter Schools Compared to Gains for VCR by School Locale	14
Figure 7: Average Learning Gains in ID Charter Schools Compared to Gains for VCR by School Grade Configuration	16
Figure 8: Student Learning Gains for Students in Online and Brick-and-Mortar Charter Schools Benchmarked against Learning Gains for Average TPS VCRs.....	18
Figure 8a: Student Learning Gains in Online Charter Schools Benchmarked against Students in Brick-and-Mortar Charter Schools.....	19
Figure 9: Relative Learning Gains for White Charter School Students Benchmarked against Their White TPS Peers	26
Figure 10: Learning Gains of Black Students Benchmarked against Learning Gains of White TPS Students	27
Figure 10a: Relative Learning Gains for Black Charter School Students Benchmarked against Their Black TPS Peers	28
Figure 11: Learning Gains of Hispanic TPS and Charter Students Benchmarked against Learning Gains of White TPS Students.....	29
Figure 11a: Relative Learning Gains for Hispanic Charter School Students Benchmarked against Their Hispanic TPS Peers	30
Figure 12: Overall Learning Gains for TPS and Charter Students in Poverty Compared to Students Not in Poverty	32
Figure 12a: Relative Learning Gains for Charter School Students in Poverty Benchmarked against Their TPS Peers in Poverty	33
Figure 13: Learning Gains of White TPS and Charter Students in Poverty Compared to Learning Gains of White TPS Students Not in Poverty.....	34
Figure 13a: Relative Learning Gains for White Charter School Students in Poverty Benchmarked against Their White TPS Peers in Poverty.....	35
Figure 14: Learning Gains of Hispanic TPS and Charter Students in Poverty Compared to Learning Gains of White TPS Students Not in Poverty	36
Figure 14a: Relative Learning Gains for Hispanic Charter School Students in Poverty Benchmarked against Their Hispanic TPS Peers in Poverty	37
Figure 15: Learning Gains for TPS and Charter Students with ELL Designation Compared to Non-ELL TPS Students	38

Figure 15a: Relative Learning Gains for ELL Charter School Students Benchmarked against Their ELL TPS Peers 39

Figure 16: Overall Learning Gains for TPS and Charter Students in Special Education Compared to TPS Students Not in Special Education 40

Figure 16a: Relative Learning Gains for Charter School Students in Special Education Benchmarked against Their TPS Peers in Special Education 41

Appendix Figure 1: Comparison of Starting Math Scores of Matched Charter Students and VCRs 50

Appendix Figure 2: Comparison of Starting Reading Scores of Matched Charter Students and VCRs 50

Table of Tables

Table 1: Demographic Comparison of Students in TPS, Feeders and Charters: 2015-16	7
Table 2: Demographic Composition of Overall, Brick-and-Mortar, and Online Charter Schools: 2015-16	9
Table 3: Transformation of Average Learning Gains to Days of Learning	11
Table 4: Performance of Charter Schools Compared to Traditional Schooling Alternatives in Idaho	21
Table 5: School-Level Reading Growth and Achievement in Idaho Charter Schools	23
Table 6: School-Level Math Growth and Achievement	24
Table 7: Charter School Impact on Student Subgroup Performance	42
Table 8: Summary of Statistical Significance of Findings for Idaho Charter School Students Benchmarked Against Comparable TPS Students.....	43
Appendix Table 1: Number of Observations for All Results	47
Appendix Table 2: Demographic Composition of Charter Students in the Study: Period 1	48
Appendix Table 3: Demographic Composition of Charter Students in the Study: Period 2	49

List of Acronyms & Definitions

CREDO	Center for Research on Education Outcomes
EOC	End-of-Course Exam
ELA	English Language Arts
ELLs	English Language Learners
TPS	Traditional Public School
VCR	Virtual Control Record
NAEP	National Assessment of Educational Progress
NCES	National Center for Education Statistics
OSBE	Idaho's Office of the State Board of Education
Feeder	A feeder school is a traditional public school whose students have transferred to a given charter school. We use students attending feeder schools as potential matches for students attending charter schools.
Growth	The year-to-year change in academic performance relative to one's peers. Growth can be positive or negative.

Charter School Performance in Idaho 2019

Introduction

Since the enactment of Idaho's public charter school law in 1998, more than 50 public charter schools in Idaho have offered parents and students choices in their education. Throughout the years, there have been controversies over charter schools. Supporters praise the autonomy that charter schools enjoy in adapting school designs to meet the needs of students, especially those in communities with historically low school quality. Opponents complain that charter schools take students and resources from district schools and further strain existing public schools' ability to improve. However, only a fraction of the debate is grounded in well researched evidence about charter schools' impact on student outcomes.

With the cooperation of Idaho's Office of the State Board of Education (OSBE), CREDO obtained the historical sets of student-level administrative records for the school years from 2014-15 to 2016-17. The support of OSBE staff was critical to CREDO's understanding of the character and quality of the data we received. However, the entirety of interactions with the department dealt with technical issues related to the data. CREDO has developed the findings and conclusions presented here independently.

The study provides an in-depth examination of the academic outcomes for charter schools in Idaho. This current report has two main benefits. First, it provides a rigorous and independent view of the performance of the state's charter schools. Second, the study design is consistent with CREDO's reports on charter school performance in other locations, making the results amenable to benchmarking both nationally and in other locations.

This report begins with a comparison of the students in charter schools compared to other settings. Three related analyses follow. The first type of analysis concerns the overall impact of charter schooling. These results are expressed in terms of the academic progress that a typical charter school student in Idaho would realize from a year of enrollment in a charter school. To help the non-technical reader grasp the findings, we translate the scientific estimates into estimated days of learning based on the foundation of a 180-day school year.

Both legislation and public policy operate to influence school level decisions. Accordingly, the second set of findings look at the performance of students by school attributes, as well as by school and present school average results. These findings are important to understand the range of performance at the school level. As online charter

schools serve students with different characteristics and deliver curriculum differently from brick-and-mortar charters, we break down charter impact by brick-and-mortar charters and online charters. Finally, the third set of analyses looks at the impact of charter school attendance on difference student subgroups.

The analysis shows that in a year's time, the typical charter school student in Idaho exhibits similar academic progress in math and stronger growth in reading compared to the educational gains that the student would have made in a traditional public school (TPS). Thinking of a 180-day school year as "one year of learning," an average Idaho charter student experiences stronger annual growth in reading equivalent to 24 additional days of learning. When we look across charter schools in Idaho, we find important performance differences. Roughly forty percent of charter schools show academic progress that is significantly better than the local district options in reading and math. Finally, the student subgroup analysis reveals little differences in the performance of students of different race/ethnicity groups and for students in designated student support programs, except for White students. White charter students account for the majority of charter students in Idaho and they experience higher learning gains in reading and math associated with their attendance in charter schools.

Study Approach

This study of charter schools in Idaho focuses on the academic progress (growth) of students in Idaho's charter schools. In order to study their progress over time, a regular measure of academic performance is needed, so the analysis is constrained to enrolled students who took the state-mandated accountability tests. Our outcome of interest is the one-year gain in learning of charter school students.

Whatever else charter schools may provide their students, their contributions to students' readiness for secondary education, high school graduation, and post-secondary life remains of paramount importance. If charter schools do not succeed in forging strong academic futures for their students, it is unclear whether social and emotional skills can compensate. Furthermore, current data limitations prevent the inclusion of non-academic outcomes in this analysis.

To study academic performance of charter students in Idaho, we relied on scores students received on Idaho state standardized achievement tests. Achievement tests capture what a student knows at a point in time. These test results were fitted into a bell curve format that enabled us to see how students moved from year to year in terms of academic performance. Two successive test scores allow us to see how much progress a student makes over a one-year period; this is also known as a growth score or learning gain. Growth scores allow us to zero in on the contributions of schools separately from other things that affect point-in-time scores. The parsed effect of schools in turn gives us the chance to see how students' academic progress changes as the conditions of their education transform. This is the analytic foundation for our examination of the academic impact of enrollment in charter schools.

We employ the Virtual Control Record (VCR) method developed by CREDO in our analysis.¹ We strive to build a VCR for each charter school student. A VCR, or a “virtual twin”, is a synthesis of the actual academic experiences of up to seven students who are identical to the charter school student, except for the fact that the VCR students attend a TPS that each charter school’s students would have attended if not enrolled in the charter school. This synthesized record is then used as the counterfactual condition to the charter school student’s performance.



[Click here for an infographic about the Virtual Control Record method.](#)

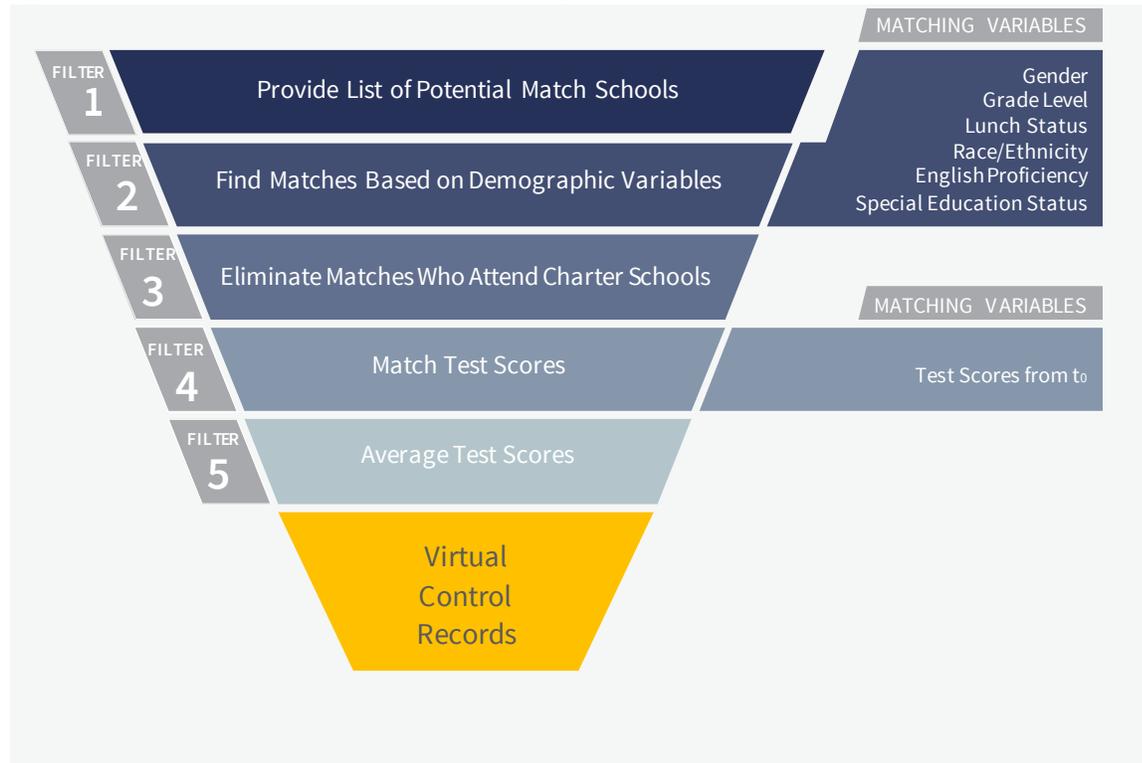
Our approach is displayed in Figure 1. We identify all the traditional public schools whose students transfer to a given charter school; each of these schools is designated as a “feeder school.” Using the records of the students in those schools in the year prior to the test year of interest (t_0), CREDO selects all of the available TPS students who match each charter school student.

Match factors include:

- Grade level
- Gender
- Race/Ethnicity
- Free or Reduced-Price Lunch Status
- English Language Learner Status
- Special Education Status
- Prior test score on Idaho state achievement tests

¹ Davis, D. H., & Raymond, M. E. (2012). Choices for studying choice: Assessing charter school effectiveness using two quasi-experimental methods. *Economics of Education Review*, 31(2), 225–236.

Figure 1: CREDO Virtual Control Record Methodology



At the point of selection as a VCR-eligible TPS student, all candidates and the individual charter school student have identical traits and matching baseline test scores. The focus then moves to the subsequent year, t1. The scores from this test year of interest (t1) for as many as seven VCR-eligible TPS students are then averaged and a Virtual Control Record is produced. The VCR produces a score for the test year of interest that corresponds to the expected result a charter student would have realized had he or she attended one of the traditional public schools.

The above VCR method has been used in previous CREDO publications. In our previous reports, if a charter student could be tracked for multiple periods in the study window, we matched the student for all the periods using the records in the year prior to the first growth period. In this study, we match the student period by period to conform to the new baseline equivalence criteria specified in Procedures Handbook Version 4.0 of What Works Clearinghouse (WWC).² Altering the match in this way means that caution is advised when comparing findings in this study and previous reports.

² What Works Clearinghouse, “Procedures Handbook Version 4.0,” 2017, https://ies.ed.gov/ncee/wwc/Docs/referenceresources/wwc_procedures_handbook_v4.pdf.

Using statistical methods, we isolate the contributions of schools from other social or programmatic influences on a student's growth. Student growth data are analyzed in standard deviation units so that the results can be assessed for statistical differences. All the findings that follow are reported as the **average one-year growth** of charter school students relative to their VCR-based comparisons. With three years of student records in this study, it is possible to create two periods of academic growth. Additional details of the matching methodology are provided in the Technical Appendix. In this study of Idaho, it was possible to create virtual matches for 84 percent of tested charter school observations in reading or math.

To assist the reader in interpreting the meaning of growth, we include an estimate of the number of days of learning required to achieve growth of particular units of standard deviations. This estimate was calculated by Dr. Eric Hanushek and Dr. Margaret Raymond based on the 2017 National Assessment of Educational Progress (NAEP) test scores.³ Using a standard 180-day school year, each one standard deviation (s.d.) change in effect size is equivalent to 590 days of learning.

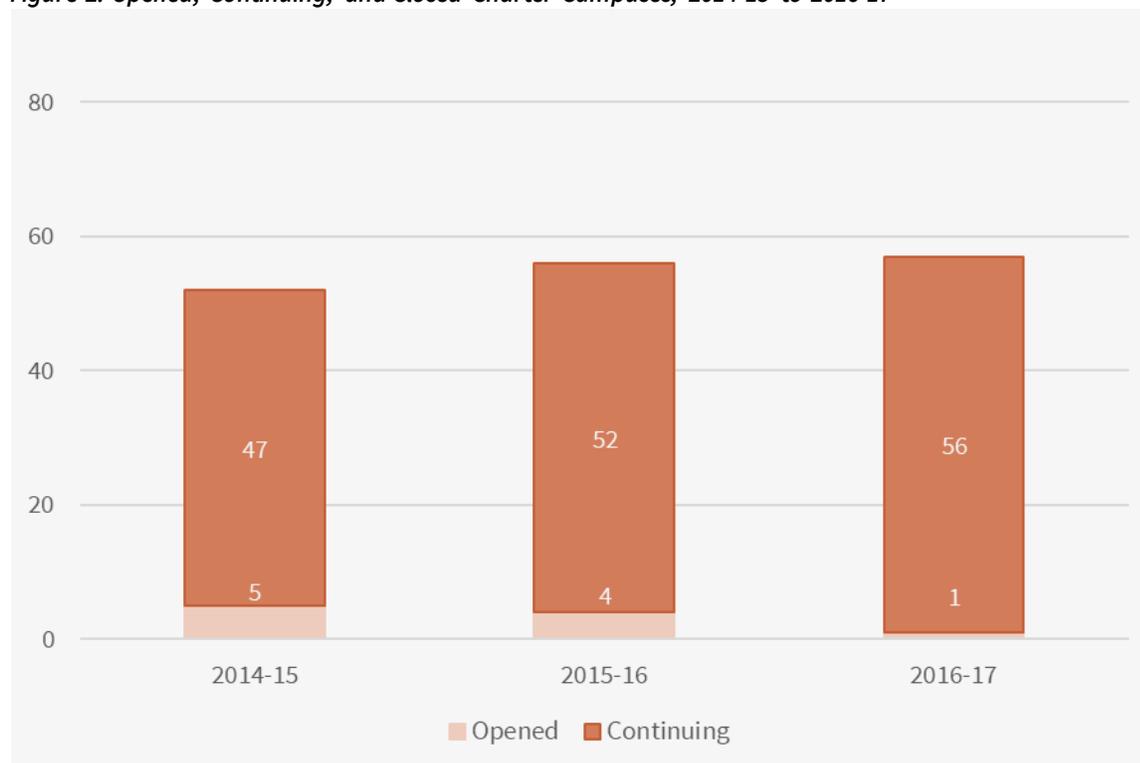
³ Detailed information about the 2017 NAEP test scores can be accessed via the “NAEP Reading Report Card” at https://www.nationsreportcard.gov/reading_2017/?grade=4 and the “NAEP Mathematics Report Card” at https://www.nationsreportcard.gov/math_2017/?grade=4.

Idaho Charter School Landscape

Idaho Charter School Demographics

The Idaho charter school sector grew slightly over the three-year study period. Figure 2 notes the newly opened, continuing, and closed charter school campuses from the 2014-15 school year to the 2016-17 year according to the National Center for Education Statistics (NCES).⁴ Figure 2 portrays an upward trend in the number of charter schools open in Idaho over three years.

Figure 2: Opened, Continuing, and Closed Charter Campuses, 2014-15 to 2016-17



The overall size of the charter school community has three different components. The first is the number of existing charter schools that continue operations from one year to the next. The second is the number of charter schools that are closed in a given year. The third factor is the number of new charter schools that open in a given year. In Idaho, charter campus expansion was partly driven entirely by opening of new campuses; there were no

⁴ The data were retrieved from “Public Elementary/Secondary School Universe Survey Data,” National Center for Education Statistics, <https://nces.ed.gov/ccd/pubschuniv.asp>. “Opened schools” indicates schools opened as new schools in the fall of the displayed year. “Continuing schools” indicates schools that were opened prior to the fall of the displayed year and remain open into the next school year (i.e. a school listed as continuing in the 2016-17 column opened some time prior to 2016-17 and did not close in 2016-16). There were no charter schools that ceased operation in the years covered in this study.

closures. The total number of charter schools increased from 52 schools in the 2014-15 school year to 56 and 57 in 2015-16 and 2016-17, respectively.

The demographics of student population in charter schools may not mirror those of the TPS in Idaho as a whole. As charter schools are able to choose their location, the demographic profile of the set of students they attract may differ from the overall community profile. Furthermore, charter schools may offer different academic programs and alternate school models which may disproportionately attract particular groups of students relative to TPS. In addition, parents and students choose to attend charter schools for a variety of reasons, such as location, school safety, small school size, academic focus, or special interest programs. The cumulative result of all these forces is that the student populations at charter schools and their TPS feeders⁵ may differ. Table 1 presents the characteristics of the student populations in all Idaho traditional public schools, in those TPS that comprise the set of charter feeder schools, and in the charter schools themselves in the 2015-2016 school year.

Table 1: Demographic Comparison of Students in TPS, Feeders and Charters: 2015-16

	TPS	Feeders	Charters
Number of schools	691	382	54
Average enrollment per school	395	502	359
Total number of students enrolled	272,869	191,673	19,381
Students in Poverty	27%	28%	19%
English Language Learners	5%	5%	1%
Special Education Students	11%	11%	9%
White Students	76%	76%	81%
Black Students	1%	1%	1%
Hispanic Students	18%	18%	9%
Asian/Pacific Islander Students	2%	2%	2%
Native American Students	1%	1%	4%
Multi-Racial Students	2%	3%	2%

The data in Table 1 show that the demographic profile of charter schools is different from that of the public school population in Idaho as a whole and also different from the feeder schools their students would otherwise attend. In fact, the demographics for the feeder schools are more similar to the TPS population than to the charter population. The charter schools in Idaho have larger shares of White, and Native-American students and smaller

⁵ A feeder school is a traditional public school whose students have transferred to a given charter school. We use students attending feeder schools as potential matches for students attending charter schools.

proportions of Hispanic students than TPS and feeder schools. The percentage of students in poverty enrolled in charter schools is noticeably smaller than in TPS and feeders.⁶

The proportion of students in charter schools receiving special education services is a continuing topic of focus and debate. As seen in Table 1, nine percent of students in Idaho charter schools have a designated Special Education status, two percentage points lower than the distributions in TPS and the feeder schools. The percentage of students with special education needs in Idaho charters differs from Idaho TPS and feeders only by a couple of percentage points. The difference in the proportion of students with special education needs between charters and traditional public schools in Idaho is similar to the difference in the proportion of special education students between national charter schools and traditional public schools at the national level.⁷ A smaller share of Idaho charter school population is designated as English language learners than the shares in the feeder schools and all of TPS. The student profile for the entire charter school community as displayed in Table 1 does not reveal any strong advantages in the stock of students attending charter schools.

Online charter schools have received increasing attention in the educational landscape nationally and in Idaho. With no physical or geographic barriers to enrollment, online charter schools draw students from across the state and use online instruction as the method of curriculum delivery. People often use the terms of “online schools”, “cyber schools”, and “virtual schools” interchangeably. Virtual schools in this study adhere to the definition of virtual schools by the National Center for Education Statistics (NCES). According to the definition of NCES (2016, p.9), a school is a virtual school if it is “a public school that only offers instruction in which students and teachers are separated by time or location, and interaction occurs via computers or telecommunications technologies. A virtual school generally does not have a physical facility that allows students to attend classes on site.”⁸

As shown in a one-year snapshot in Table 2, online charter schools educate more than 15 percent of Idaho charter students and serve different student populations than brick-and-mortar charters. It is useful to note that online charters enroll more about 50 percent more students than brick-and-mortar charters; even so, the size of Idaho online charters is much smaller than is seen elsewhere. Of particular interest is the high share of Native American students in Idaho online charter schools, 13 percent contrasts sharply to their share in brick-and-mortar schools as well as TPS and feeder schools, all of which have 1 percent of their enrollment as Native Americans. This larger fraction helps explain why the share of white students in online charters is lower than other charter schools. Online charters also serve more students living in poverty than brick-and-mortar charters. The number of Special Education students is greater in Idaho online charters than in brick-and-mortar charters. Overall, within-sector

⁶ Our information on eligibility for subsidized school meals reflects Idaho’s State Department of Education’s information on eligibility confirmed through “Direct Certification.” See also footnote 18.

⁷ National Center for Special Education in Charter Schools, “Key Trends in Special Education in Charter Schools”, 2018, retrieved from <http://www.ncsecs.org/blog/2018/10/8/key-trends-in-special-education-in-charter-schools>.

⁸ National Center for Education Statistics, “Documentation to the 2014-15 Common Core of Data (CCD) Universe Files,” 2016, retrieved from “Public Elementary/Secondary School Universe Survey Data,” <https://nces.ed.gov/ccd/pubschuniv.asp>.

comparisons in Table 2 indicate that online charter schools serve larger shares of students who are disadvantaged on various dimensions than brick-and-mortar charters.

Table 2: Demographic Composition of Overall, Brick-and-Mortar, and Online Charter Schools: 2015-16

	All Charters	Brick-and-Mortar Charters	Online Charters
Number of schools	54	44	10
Average enrollment per school	359	330	488
Total number of students enrolled	19,381	14,501	4,880
Students in Poverty	19%	17%	28%
English Language Learners	1%	1%	1%
Special Education Students	9%	7%	13%
White Students	81%	83%	76%
Black Students	1%	1%	1%
Hispanic Students	9%	10%	8%
Asian/Pacific Islander Students	2%	2%	1%
Native American Students	4%	1%	13%
Multi-Racial Students	2%	3%	2%

Analytic Findings of Charter School Impacts

Overall Charter School Impact on Student Progress

A foundational question of this study is whether charter schools differ overall from traditional public schools in how much their students learn. To answer this question, we estimate the one-year academic gains observed for all matched charter school students in all growth periods and compare their average learning gain with that of the VCR students.

Please refer to the text box titled Graphics Roadmap No. 1 where guidance is provided to help readers understand the charts that follow.

As described in the Study Approach section, student growth data are analyzed in units of standard deviations so that the results can be assessed for statistical differences. To help the reader interpret our analysis results, we transform standard deviation units of growth into days of learning, shown in Table 3.⁹

In order to understand “days of learning,” consider a student whose academic achievement is at the 50th percentile in one grade and also at the 50th percentile in the following grade the next year. The progress from one year to the next equals the average learning gains for a student between the two grades. That growth is fixed as 180 days of effective learning based on the typical 180-day school year.

Students with positive differences in learning gains have additional growth beyond the expected 180 days of annual academic progress while those with negative differences in learning gains have fewer days of academic progress in that same 180-day period of time. Interested readers can refer to the Study Approach section and Appendix B (Technical Appendix) for additional details on the computation of days of learning.

⁹ The values in Table 3 are updated from past reports using the latest (2017) NAEP scores, which show slower absolute annual academic progress than earlier administrations. See Eric A. Hanushek, Paul E. Peterson, and Ludger Woessmann, “Achievement Growth: International and U.S. State Trends in Student Performance,” *Education Next* 12 (July 2012): 1–35.

Graphics Roadmap No. 1

The graphics in this section have a common format.

Each graph presents the average performance of charter students relative to their **pertinent comparison students**. The reference group differs depending on the specific comparison being made. Where a graph compares student subgroup performance, the pertinent comparison student is the same for both subgroups. Each graph is labeled with the pertinent comparison group for clarity.

We show two axes on the graphs to help the reader get a sense of learning gains. The **left axis** indicates standard deviation units of learning gains of charter students relative to their comparison students. The **right axis** displays the same learning gains in days of learning. The statistical tests are performed on the values as they are enumerated on the left axis.

The **height** of the bars in each graph reflects the difference between charter school performance and the comparison student group.

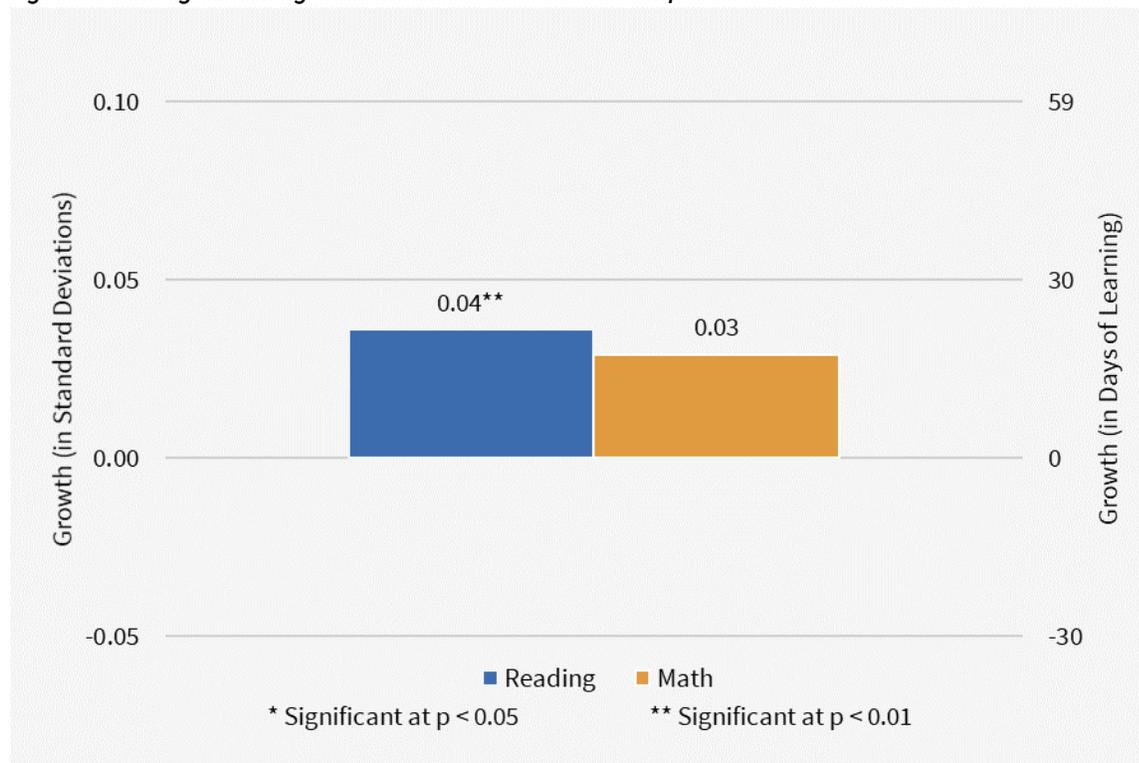
Stars are used to reflect the level of statistical significance of the difference between the group represented in the bar and its comparison group of similar students in TPS. The absence of stars means that the schooling effect is not statistically different from zero.

Table 3: Transformation of Average Learning Gains to Days of Learning

Standard Deviations	Days of Learning
0.05	30
0.10	59
0.15	89
0.20	118
0.25	148
0.30	177
0.35	207

Figure 3 displays the overall charter school impact on student academic progress in Idaho. The reference group, represented by the 0.00 baseline in the graph, is the average TPS VCRs in the state. Using the results from Figure 3 and the transformations from Table 3, we can see that in a typical school year, charter students in Idaho experience higher academic progress than their TPS peers in reading. This advantage for charter students is equivalent to 24 additional days of learning in reading in a 180-day school year. Because the difference in the growth in math is not statistically significant, Idaho charter students experience similar growth in the 180-day period as they would have in a traditional school setting.

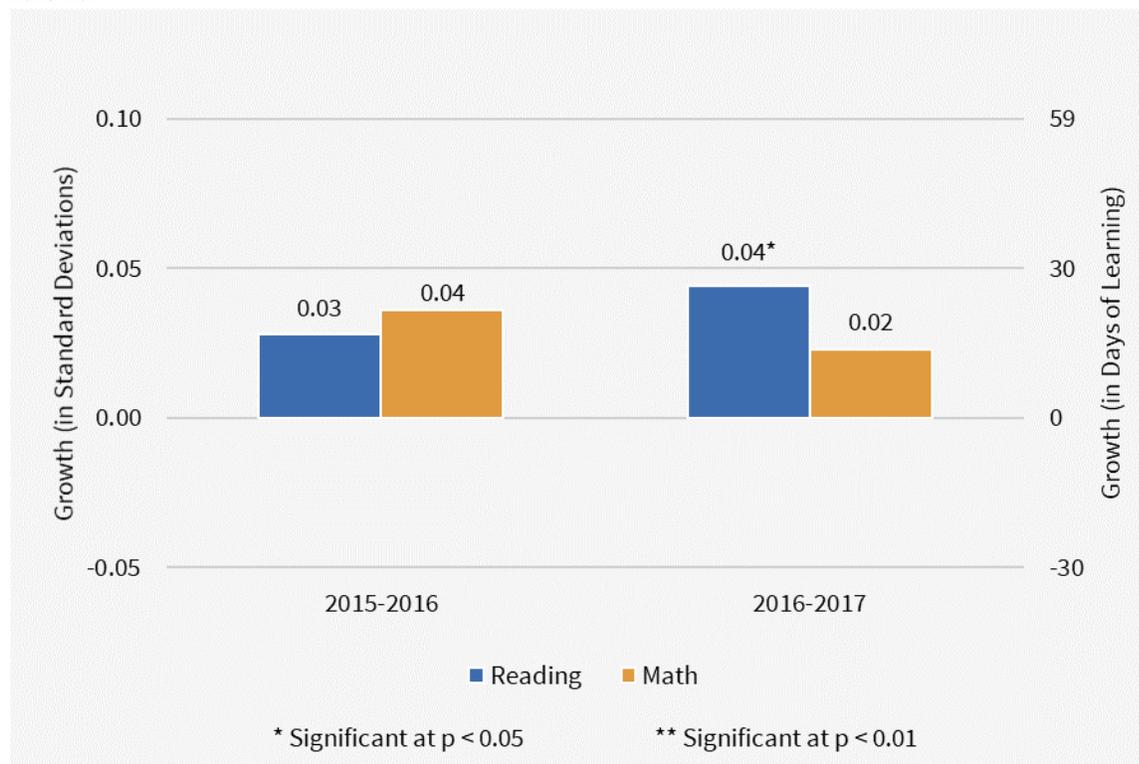
Figure 3: Average Learning Gains in ID Charter Schools Compared to Gains for TPS VCRs



Charter School Impact by Growth Period

To determine whether performance is consistent over the window of this study, the impact of attending a charter school on academic progress is examined separately for each of the three growth periods. Recall that a growth period is the measure of progress from one school year to the next. In the presentation of results in Figure 4, the denotation "2015-2016" covers academic growth that occurred between the end of the 2014-2015 school year and the end of the 2015-2016 school year. Similarly, the denotation "2016-2017" corresponds to the year of growth between the 2015-2016 and the 2016-2017 school years. To determine whether performance was consistent over recent time, the average charter school effects were disaggregated into the two growth periods of this study.

Figure 4: Average Learning Gains in ID Charter Schools Compared to Gains for VCR Students by Growth Period, 2015-2017



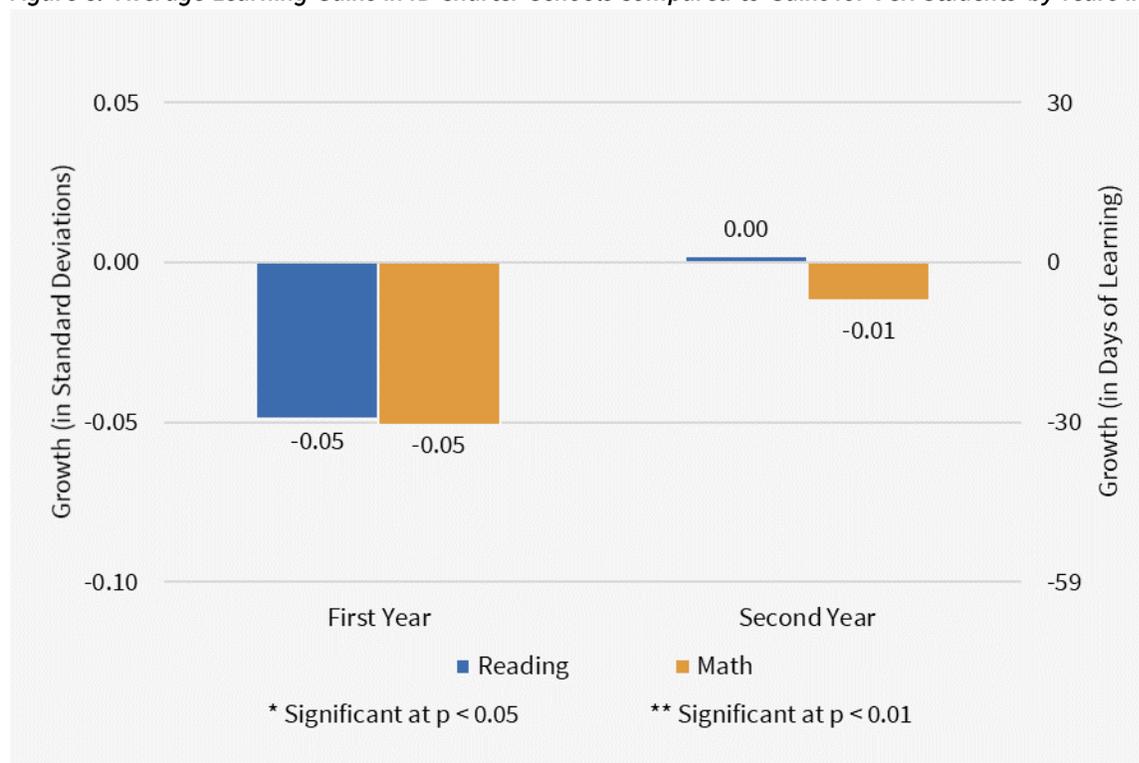
The gains of Idaho charter school students in the 2015-2016 growth period do not differ statistically from the performance of their TPS peers in either reading or math. At the same time, the gains of Idaho charter school students in the 2016-2017 growth period are significantly higher than the growth of their TPS peers in reading. We do not find charter school students to have statistically different math gains from the gains of their TPS peers. During the 2016-2017 growth period, charter students demonstrate growth of approximately 24 more days of learning in reading compared to their TPS counterparts.

Charter School Impact by Students' Years of Enrollment

Students' academic growth may differ depending on how many years they enroll in a charter school. To test the relationship between progress and the length of enrollment in a charter school, we group separately test scores from students in the first year of charter enrollment and scores from students in their second year of charter attendance. In this scenario, the analysis is limited to the charter students who enroll for the first time in a charter school between the 2015-16 and 2016-17 school years and their TPS VCRs. Thus, while the analysis of the overall charter impact uses 14,915 student observations in reading and 14,814 student observations in math, the analysis of charter impact by the number of years of charter enrollment speaks to 4,016 and 4,005 student observations in reading and math, respectively. A further breakout of the number of student observations by different lengths of charter attendance is provided in Appendix A.

Although this approach reduces the number of students included, it ensures an accurate measure of the effect of continued enrollment over time. The results for this subset of the full study sample should not be directly compared with other findings in this report. The results are shown below in Figure 5.

Figure 5: Average Learning Gains in ID Charter Schools Compared to Gains for VCR Students by Years in Charter



As Figure 5 shows, Idaho charter school students experience learning growth in the first and the second year of charter attendance that is not statistically different from that of students (VCR) enrolled in traditional public school settings. Drawing from CREDO's National Charter School Study II (2013), we find that the learning gains associated with the second year of charter school attendance in Idaho are not too far below the average learning gains associated with the second year of charter school attendance. At the same time, in the earlier national

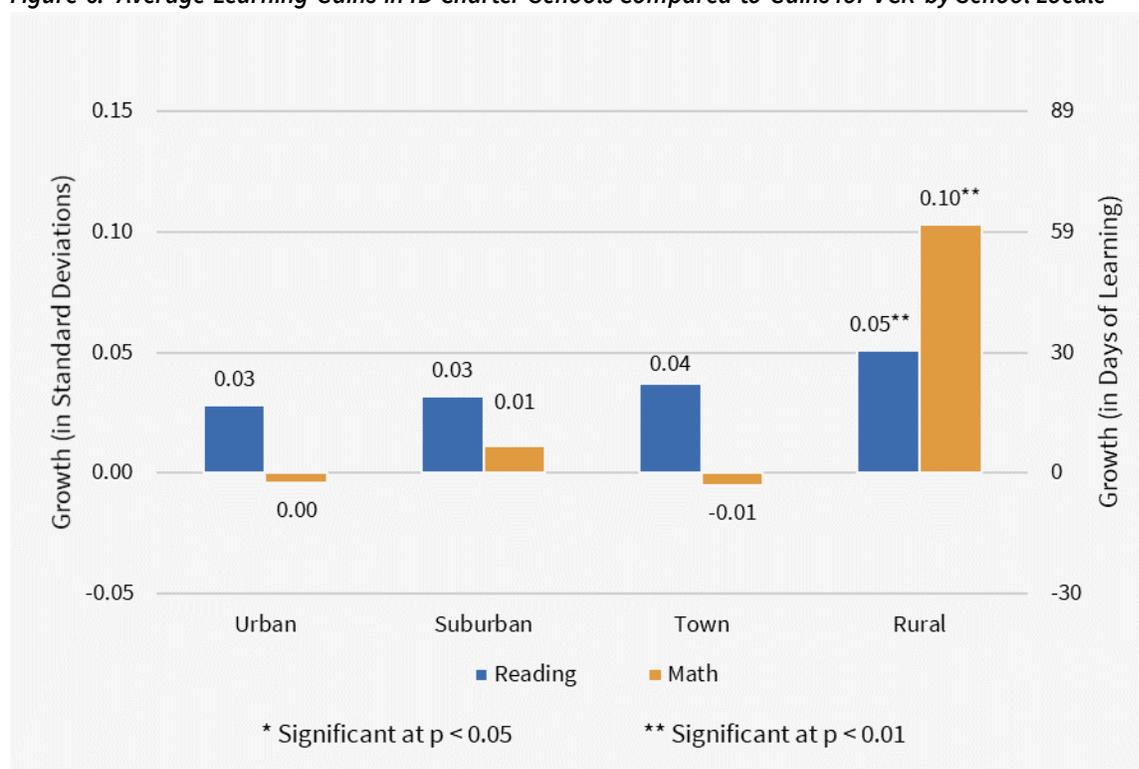
study, the second year of charter school attendance is associated with higher learning growth when compared to the first year of charter school attendance. This pattern is also seen in Idaho, although this trajectory is short, given the limited year span of this study.

Charter School Impact by School Attribute

Charter School Impact by School Locale

Depending on their locales, charter schools may serve different student populations, face different levels of available human capital or both. Though charter schools in urban areas receive the bulk of media attention, charter schools in other locales may produce different results. The results in Figure 5 represent the disaggregated impacts of charter school enrollment for urban, suburban, town, and rural charter schools. In this breakdown, charter students in different locations are compared with their virtual twins in TPS.¹⁰ For the following analysis, the comparison is relative to whatever actual progress each group of VCRs realized. But the reader should not assume that the transformation of each VCR group to 0.00 means that all the VCRs have equivalent academic growth.

Figure 6: Average Learning Gains in ID Charter Schools Compared to Gains for VCR by School Locale



¹⁰ The National Center for Education Statistics defines 12 urban-centric locales which are divided into four main locale types: city, suburb, rural, and town.

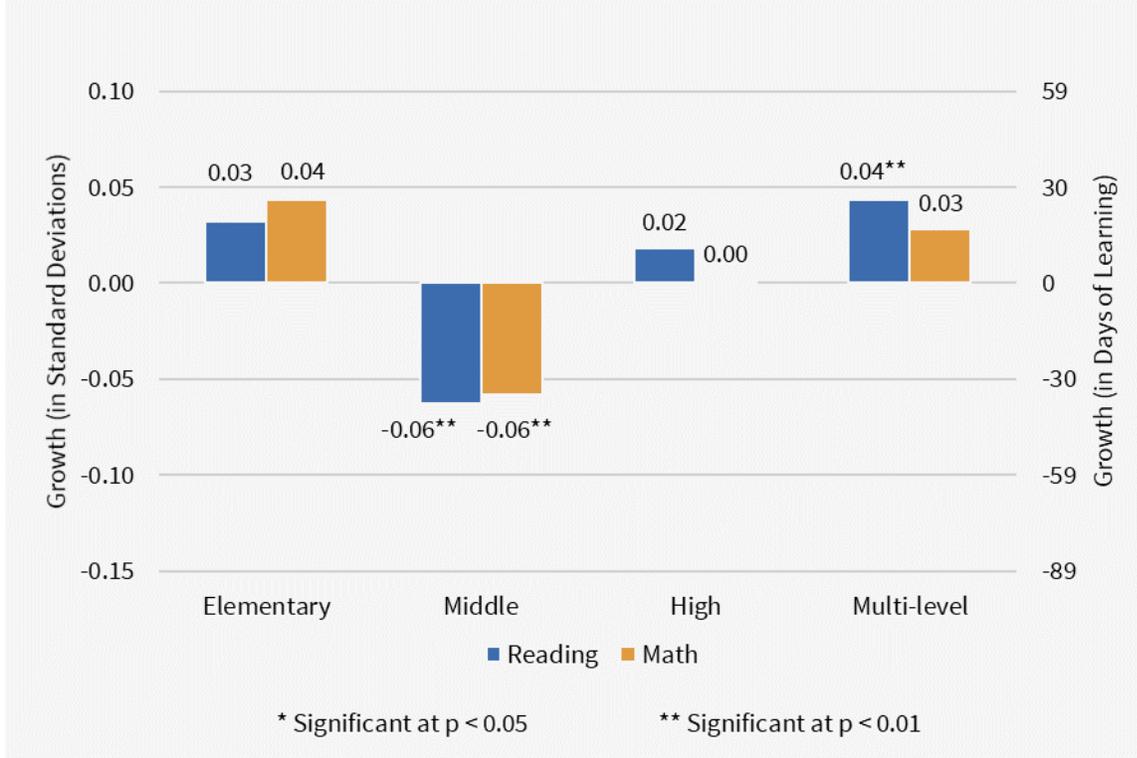
Figure 6 illustrates differences in the academic growth of charter students across locales. Figure 6 shows that Idaho charter students in urban, suburban or town locations perform similarly to their respective TPS VCRs in both reading and math. Students in rural charter schools outperform their TPS VCRs by 30 days of learning in reading and 59 days of learning in math. This finding is important for two reasons. It stands in sharp contrast to results for rural charter schools in other states. The second insight is that rural charters contribute significantly to the overall differences between students from all charters and their TPS VCRs shown earlier in Figure 3.

Charter School Impact by School Grade Configuration

All charter schools choose which grade levels to offer. Some charter operators focus on particular grades, some seek to serve a full range of grades, and others develop by adding one additional grade each year. The National Center for Education Statistics assigns schools the label of “elementary school,” “middle school,” “high school,” or “multi-level” school based on their predominant grade pattern.¹¹ The designation “Multi-level charter schools” can apply to a school that serves elementary and middle grades, middle and high grades, or all K-12 grades. Looking at performance by school grade configuration helps inform us whether specialization in a specific range of grades produces better results. Figure 7 shows the learning gains of students in charter schools of different grade configurations compared to their respective VCRs in TPS. The reader should not assume that the transformation of each VCR group to 0.00 means that all the VCRs have equivalent academic growth.

¹¹ The National Center for Education Statistics (NCES) designates a school as an elementary, middle, high, or multi-level school. CREDO uses the designation by NCES. The sole exception is that CREDO considers a school to be a high school if the lowest grade served is ninth grade or above.

Figure 7: Average Learning Gains in ID Charter Schools Compared to Gains for VCR by School Grade Configuration



The results in Figure 7 show that, on average, charter multi-level school students post the strongest academic growth compared to their TPS virtual twins in reading. Their growth in math is similar. The reading result is equivalent to 24 additional days of learning. Students attending elementary or high charter schools demonstrate similar growth in reading and math, compared to their TPS VCRs.

Opposite patterns are found among charter students enrolled in middle schools. Students in middle charter schools experience the weakest growth compared to their TPS virtual twins in both reading and math, where they have an equivalent of 35 fewer days of learning than TPS VCRs in either subject.

Charter School Impact by Delivery System

There are both brick-and-mortar and online charters in Idaho.¹² Students from all over the state can attend online charter schools and receive instruction online. As Table 2 reveals, online charter schools enroll over 25 percent of charter students; 4,880 of the state's roughly 19,000 students attend the 10 online campuses in Idaho. Table 2 also shows that online schools have different student compositions compared to brick-and-mortar charters. CREDO's earlier study also finds that online charter schools serve students with higher mobility rates and, across the group of online schools studied, had significantly negative impacts on student academic progress.¹³

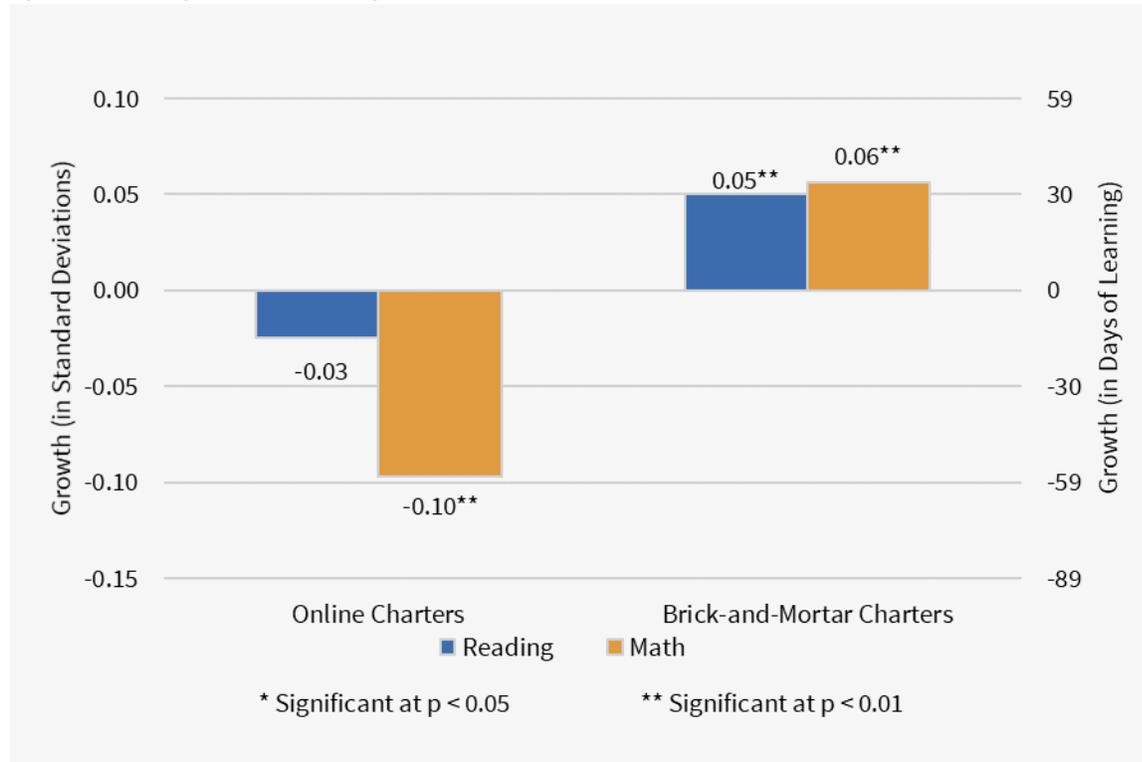
In this sector, we break down the charter school impact on student performance by delivery system and display two distinct comparisons in two graphs:

1. Figure 8 compares the performance of students in online charter schools and students in brick-and-mortar charters against the performance of a common reference group, the "statewide average TPS VCR."
2. Figure 8a compares the difference in learning of students enrolled in online charter schools and those who attend brick-and-mortar charters.

¹² We use information from Idaho's State Department of Education to identify online charter schools: <https://www.sde.idaho.gov/school-choice/files/School-Choice-Packet.pdf>, Retrieved on Dec 5th, 2018

¹³ James L. Woodworth, Margaret E. Raymond, Kurt Chirbas, Maribel Gonzalez, Yohannes Negassi, Will Snow, and Christine Van Donge, *Online Charter School Study 2015*, CREDO (Center for Research on Education Outcomes), Stanford University, <https://credo.stanford.edu/pdfs/Online%20Charter%20Study%20Final.pdf>.

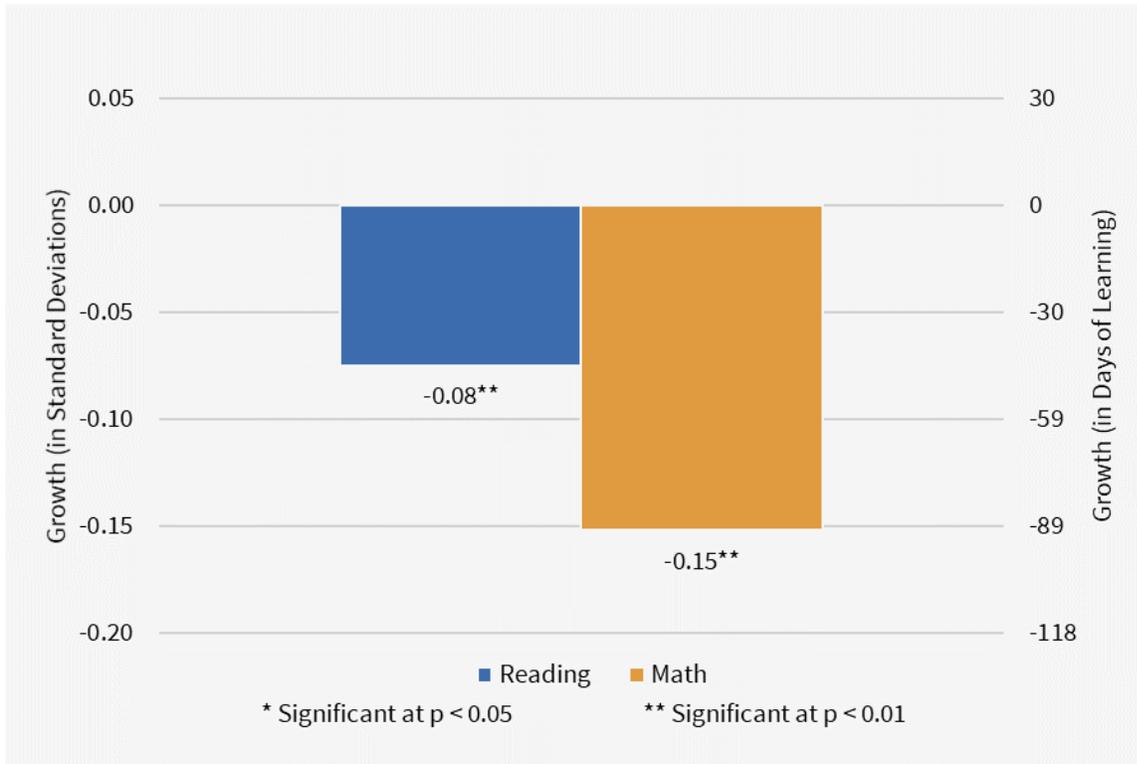
Figure 8: Student Learning Gains for Students in Online and Brick-and-Mortar Charter Schools Benchmarked against Learning Gains for Average TPS VCRs



According to Figure 8, students attending online charter schools have similar growth in reading and weaker growth in math compared to the average TPS VCRs. The gap translates to 59 fewer days of learning in math for online charter students. It is worth highlighting the contrast between the results for online charter schools in Idaho to our earlier findings for online charters schools in 17 states and the District of Columbia.¹³ Specifically, CREDO’s earlier study found significant learning losses for online charters in both reading and math. We find no learning loss in reading associated with online charter schools in Idaho, while the learning loss in math is smaller than that at the national level, found in CREDO’s earlier study. Students in brick-and mortar charters exhibit stronger growth in reading and math, equivalent to 30 and 35 extra days of learning, respectively, compared with the average TPS students.

Figure 8a benchmarks the performance of students in online charter schools against that of students attending brick-and-mortar charters (whose performance is represented by the 0.00 line). Online charter school students gain significantly less in both subjects. To be specific, they are behind brick-and-mortar charter students by 47 days of learning in reading. The lag in math is greater, with online charter students losing an equivalent of 77 days of learning as compared to students in brick-and-mortar charters.

Figure 8a: Student Learning Gains in Online Charter Schools Benchmarked against Students in Brick-and-Mortar Charter Schools



Figures 8 and 8a above demonstrate two important points: First, Idaho online charter students fall behind in both reading and math compared to the average statewide student in TPS or brick-and-mortar charter schools. Second, the negative performance of online charter students is sufficiently large to wipe out the positive growth of brick-and-mortar charter students in math, which leads to the lack of overall Idaho charter effect in math growth in Figure 3. Similarly, the overall positive charter impact on reading progress in Figure 3 is lessened by the lagging growth in reading of students in online charter schools.

School-Level Analysis

The numbers reported in the previous sections represent the typical learning gains at the student level across the state; they reveal what would be the likely result if a typical student were enrolled in any of the Idaho charter schools. The prior results do not let us discern whether some charter schools are better than others. Since school-level results are of interest to policy makers, parents and the general public, we aggregate charter student performance up to the school level for each charter school in the state. This view is necessarily limited to charter schools with a sufficient number of tested students to make a reliable inference on performance.

It is important to understand the counterfactual used in this section. As shown in Table 1 earlier in the report, the student populations within the typical charter school and their feeder schools differ, making whole-school to whole-school comparisons unhelpful. Here instead, we pool each school's VCRs to simulate "apples to apples" for traditional public schools and to serve as the control condition for testing the performance of charter schools. This simulated TPS reflects a precise estimate of the alternative local option for the students actually enrolled in each charter school.

The Range of School Quality

To determine the range of charter school performance, we estimate the annual learning impact of each charter school over the two most recent growth periods (2015-2016 and 2016-2017). The estimated learning impact for each charter school can be positive (statistically different from zero with a positive sign), negative (statistically different from zero with a negative sign), or zero. We use it to infer how the academic quality of a charter school compares to the quality of traditional public schools which students in that charter school would have potentially attended if they had not attended a charter school.

A statistically positive learning impact for a charter school suggests that the charter school has stronger learning growth than the alternative TPS options for its students. A statistically negative learning impact for a charter school implies the school makes less progress than the traditional schools its students would have attended. A zero learning impact means that the charter school and the TPS alternatives for its students have similar performance.

Our total sample consists of 41 schools with reading scores and 41 schools with math scores in the 2015-2016 and 2016-2017 growth periods.¹⁴ Table 4 below shows the breakout of the performance for the included Idaho charter schools.

¹⁴ As noted in Table 1, charter schools are smaller on average than their corresponding feeder schools. Furthermore, some charter schools elect to open with a single grade and mature one grade at a time. Consequently, care is needed when making school-level comparisons to ensure that the number of tested students in a school is sufficient to provide a fair representation of the school's impact. Our criterion for inclusion is at least 60 matched charter student records over the two growth periods or at least 30 matched charter records for schools with only one growth period.

Table 4 shows the performance comparison of charter schools in Idaho relative to traditional public schooling options in reading and math, respectively. In reading, 17 out of 41 Idaho charter schools, or 41 percent, perform significantly better than the traditional schooling environments the charter students would have otherwise attended. In math, the result is the same: 17 of 41 or 41 percent of charter schools post growth that is significantly higher than that of their traditional public schooling counterparts. The results show that the share of charter schools performing significantly better than the traditional schooling alternatives is higher than the national average. To benchmark these figures at the national level using the 2013 National Charter Study II, 25 percent of charter schools outperform the traditional schooling alternatives in reading and 29 percent do so in math.¹⁵

Table 4: Performance of Charter Schools Compared to Traditional Schooling Alternatives in Idaho

Subject	Significantly Worse		Not Significantly Different		Significantly Better	
	Number	Percent	Number	Percent	Number	Percent
Reading	7	17%	17	41%	17	41%
Math	8	20%	16	39%	17	41%

At the other end of the distribution, seven of 41 Idaho charter schools, or 17 percent, have reading performance that is significantly weaker than the traditional public schooling option as compared to the national figure of 19 percent. In math, eight out of 41 of charter schools, 20 percent, post growth results weaker than the traditional public schooling option compared to the 2013 national figure of 31 percent.

In reading, 17 Idaho charter schools, 41 percent, do not differ significantly from the traditional public school option. In math, 16, or 39 percent of charter schools have growth results that is indistinguishable from the traditional public school option. It is important to emphasize that “no difference in growth” does not reflect the actual level of growth, as it is possible for charter schools to have high levels of growth that are similar to that of the traditional schooling alternative, and the reverse is also true.

¹⁵ Cremata et al., *National Charter School Study 2013*.

Growth and Achievement

While the impacts of charter schools on academic growth relative to their local competitors is informative, we are also interested in how well students perform in absolute terms. Since many of the students served by charter schools start at low levels of achievement, the combination of absolute achievement and relative growth is vital to understanding student success overall.

For each school, the tested achievement of their students over the same two periods covered by the academic growth analysis (2015-2016 and 2016-2017) is averaged and transformed to a percentile within the statewide distribution of achievement.¹⁶ The 50th percentile indicates statewide average performance for all public school students (traditional and charter). A school achievement level above the 50th percentile indicates that the school's overall achievement exceeds the statewide average. We use standard deviations discussed above to measure growth. We display each school's achievement and growth in a two-dimensional plot, displayed in Tables 5 and 6.

Graphics Roadmap No. 2

There are **four quadrants** in each of the tables 5 and 6. We have expanded on the usual quadrant analysis by dividing each quadrant into four sections. The value in each box is the percentage of charter schools with the corresponding combination of growth and achievement. The value in the center of each quadrant is the sum of the four sections in that quadrant. These percentages are generated from the 2016 and 2017 growth periods.

The uppermost box on the left denotes the percentage of charters with very low average growth but high average achievement. The box in the bottom left corner depicts low-growth, low-achieving schools.

Similarly, the uppermost box on the right contains the percentage of charters with high average growth and high average achievement. The bottom right corner contains high-growth, low-achieving schools.

The major quadrants were delineated using national charter school data. We would expect the majority of schools to have an effect size between -0.15 and 0.15 standard deviations of growth (the two middle columns). Similarly, we would expect about 40 percent of schools to achieve between the 30th and 70th percentiles. These expectations are based on how we view a normal distribution with the majority of the sample falling within one standard deviation from the mean.

¹⁶ Average achievement was computed using students' z-scores from the end of the growth period (e.g., spring 2016 and spring 2017). The resulting school-level mean was then converted into a percentile.

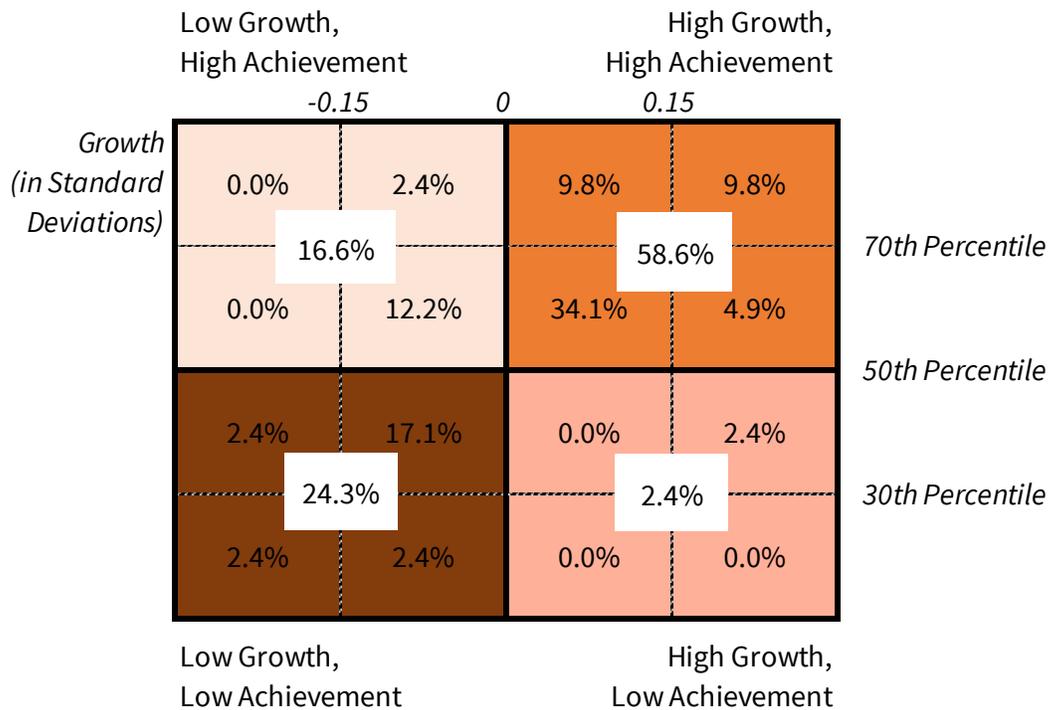
Table 5: School-Level Reading Growth and Achievement in Idaho Charter Schools



Table 5 presents the reading achievement and growth results for the Idaho charter schools included in this analysis. In the table, Seventy-one percent, 29 of the 41 Idaho charter schools, have positive average growth compared to their peer schools. (This percentage is the sum of the eight squares in the blue and pink quadrants in the right half of the table). Sixty-six percent of charters have positive growth and average achievement above the 50th percentile of the state (i.e., the total for the blue quadrant on the top right). A total of five percent of charter schools in the pink box post above-average gains but remain below the state average in absolute achievement. Over time, if the five percent of charter schools in the pink box maintain or improve their average growth, their achievement would increase, eventually moving them into the blue box.

Roughly 29 percent of schools post smaller learning gains than their peer TPS (the sum of gray and brown quadrants on the left half of the table). If their growth remains steady or worsens, they will fall in the overall distribution of achievement as other schools pull away. Approximately 24 percent of charters perform below the 50th percentile of achievement (the sum of the brown and pink cells in the lower portion of the table). The area of the greatest concern is the roughly 20 percent of schools that fall into the lower left quadrant of the table. These schools are characterized by both low achievement and low growth.

Table 6: School-Level Math Growth and Achievement



In math, 25 of the 41 Idaho charter schools (61 percent) have positive average growth in math, as seen in the combined orange and pink quadrants in the right half of Table 6. About 59 percent of charters have positive growth and average achievement above the 50th percentile (the orange quadrant in the upper right of the table). Approximately 27 percent of charters post achievement results below the 50th percentile of the state for math (the sum of cells in the lower half of the table); these percentages are slightly smaller than those presented in Table 6 for reading. In the pink quadrant in the lower right of the table, roughly two percent of the schools classified as having low achievement have high growth and appear to be on an upward trajectory. As in the previous table, the schools of the greatest concern are those in the lower left (brown) quadrant that have both low achievement and low growth; they account for roughly 20 percent of the Idaho charter schools in reading (9 of the 41), and roughly 24 percent of the charter schools in math (10 of the 41).

Charter School Impacts by Student Subgroups

Charter School Impact for Students by Race/Ethnicity

One of the enduring advances of the *No Child Left Behind Act* of 2001 and the subsequent *Every Student Succeeds Act* of 2015 is the recognition that average results may not be evenly distributed across all students. Attention to the differences in the performance of students of various racial/ethnic backgrounds and other attributes has become standard practice in most assessments of school performance. Table 1 shows that Idaho charter schools serve a somewhat diverse student population. Their ability to support the progress of disadvantaged students is an important policy goal in the state and a strong focus of this study. The effectiveness of charter schools across ethnic and racial groups is especially important given the significant shares of historically underserved students that charter schools enroll. This section investigates the impact of charter school attendance on learning gains of students of different racial backgrounds compared to their same-group peers in traditional settings.

The impact of charter schools on the academic gains of White, Black and Hispanic students is presented in Figures 9 through 11a. For Black and Hispanic students, we present two related graphs. Graphics Roadmap No. 3 in the sidebar provides guidance on how to interpret the graphs and their relation to each other. In short, the first graph depicts the growth of TPS students and charter students in the particular subgroup of

Graphics Roadmap No. 3

Figures 10 through 11a show two important contrasts for Black and Hispanic student groups. For each student subgroup we present two graphs:

The **first graph** displays the growth of TPS students and charter students in the particular **subgroup of interest** compared to the growth of the "average White TPS student." In this comparison, the White TPS student is male and does not qualify for subsidized school meals, special education services, or English Language Learner support and is not repeating his current grade. The graph sets the performance of the average White TPS student to **zero** and shows how learning of students in the subgroup compares.

The **stars** indicate if the learning gains of the subgroup are statistically different from the reference group. Thus, if there are no stars, we interpret the difference in learning gains as similar to the white TPS comparison student. The reader should not be swayed by seemingly large differences if there are no stars. If there is no difference in the learning gains, the bar would be missing entirely. If the learning of the student group in question is not as great as the comparison baseline, the bar is negative. If the learning gains exceed the comparison, the bar is positive.

Graphs labeled "a" display the results of a second comparison testing whether the learning gains in the charter school student subgroup differ significantly from their VCRs in the same student subgroup. In these graphs, the performance of the TPS peers in the subgroup are set to **zero** and the learning gains of the charter school students in the subgroup are measured against that **baseline**. As with the first graph, stars denote statistical significance.

interest as compared to the growth of the "average White TPS student". Graphs labeled "a" show whether the learning gains in the charter school student subgroup differ significantly from their VCRs in the same subgroup.

White students account for approximately 81 percent of the student population in charter schools in Idaho. Figure 9 displays the relative differences in learning between White students enrolled in TPS and White students enrolled in charter schools. The 0.00 baseline reflects the one-year academic progress of White TPS VCRs in Idaho. White students in charter schools show higher learning growth than White students attending traditional public school settings, that is equivalent to 24 additional days of learning in both math and reading.

Figure 9: Relative Learning Gains for White Charter School Students Benchmarked against Their White TPS Peers

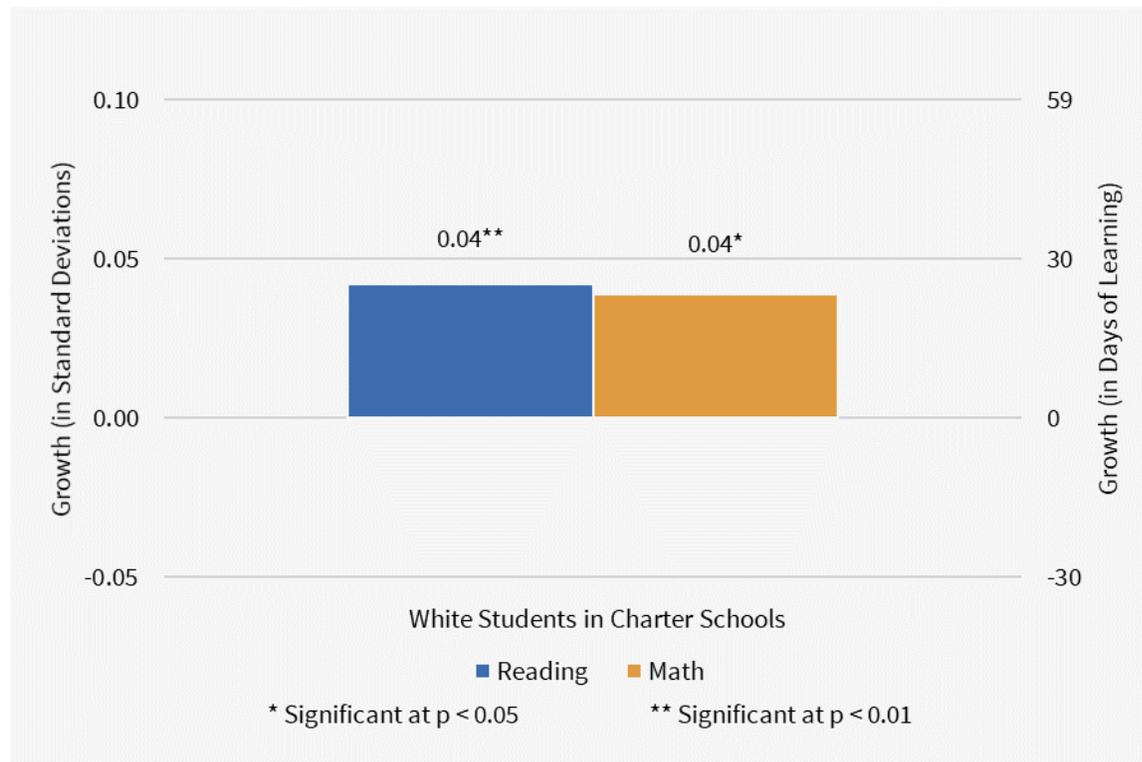
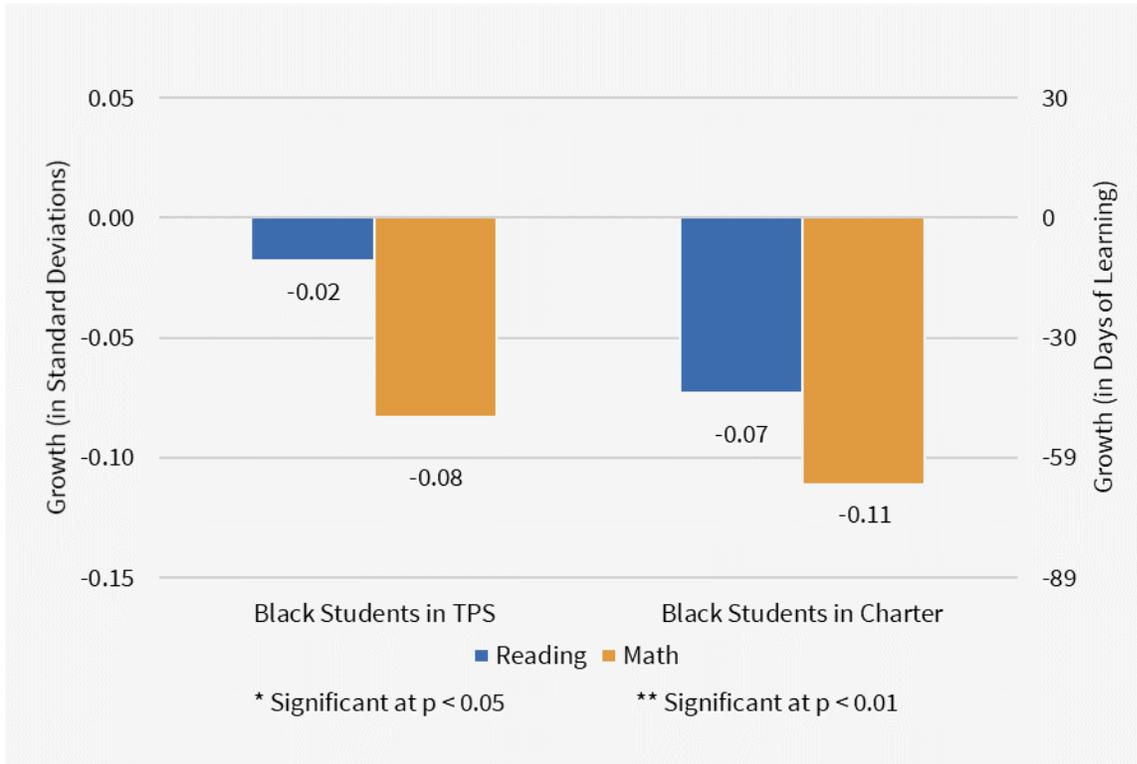
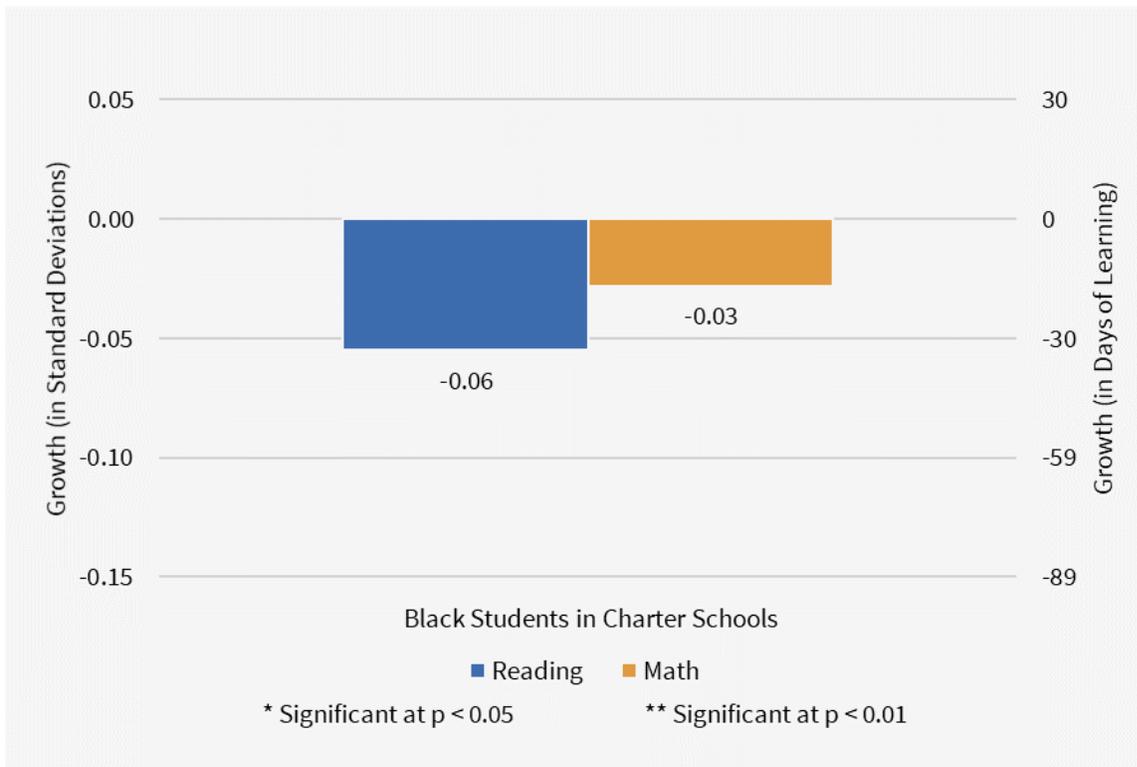


Figure 10: Learning Gains of Black Students Benchmarked against Learning Gains of White TPS Students



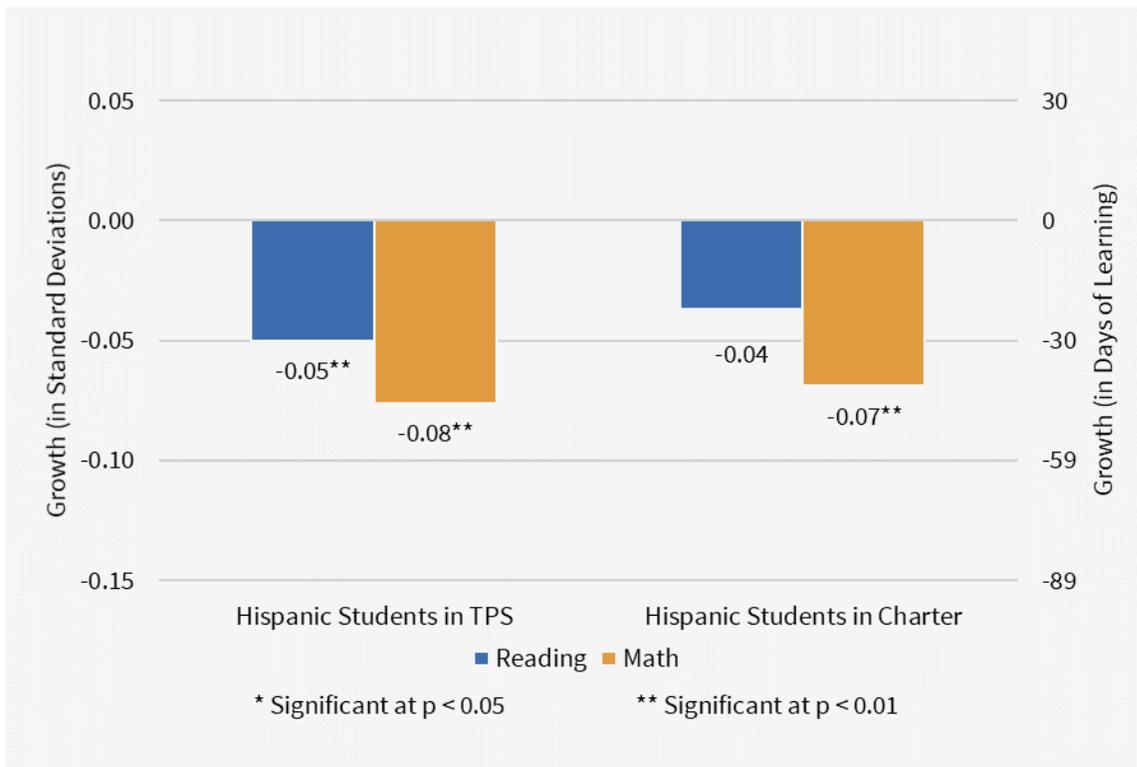
Black students account for roughly one percent of the charter school population in Idaho. As shown in Figure 10, Black students in TPS are found to have similar annual academic learning gains in reading and math when compared to the average White TPS (VCR) student. Accordingly, Black charter school students exhibit statistically similar learning growth to White TPS students in both math and reading. It is worth noting that given the limited number of black students in Idaho, it would take exceptionally large differences to trigger significance in a statistical sense.

Figure 10a: Relative Learning Gains for Black Charter School Students Benchmarked against Their Black TPS Peers



A second comparison examines the learning gains for the same student group across the two school settings to see whether the student group, in this case Black students, fare better in one or the other environment. Figure 10a displays the differences in learning growth between Black students enrolled in TPS and Black students enrolled in charter schools. In Idaho, Black charter school students experience similar growth to their Black TPS counterparts in reading and math.

Figure 11: Learning Gains of Hispanic TPS and Charter Students Benchmarked against Learning Gains of White TPS Students



An equivalent analysis for Hispanic students is presented in Figures 11 and 11a. Hispanic students account for 9 percent of charter school students in Idaho. Hispanic students in TPS are found to have significantly weaker academic growth in both reading and math compared to the average White TPS student, amounting to 30 fewer days of learning in reading and 47 fewer days of learning in math in a year. Hispanic students in charter schools have significantly weaker learning growth in math, but similar growth in reading, when compared to White TPS students over the same time period. Specifically, compared to the average White TPS student, Hispanic charter students experience 41 fewer days of math learning in a year. The finding of similar academic progress in reading between Hispanic charter students and the average White TPS student suggests a stabilization of the achievement gap in reading.

Figure 11a: Relative Learning Gains for Hispanic Charter School Students Benchmarked against Their Hispanic TPS Peers

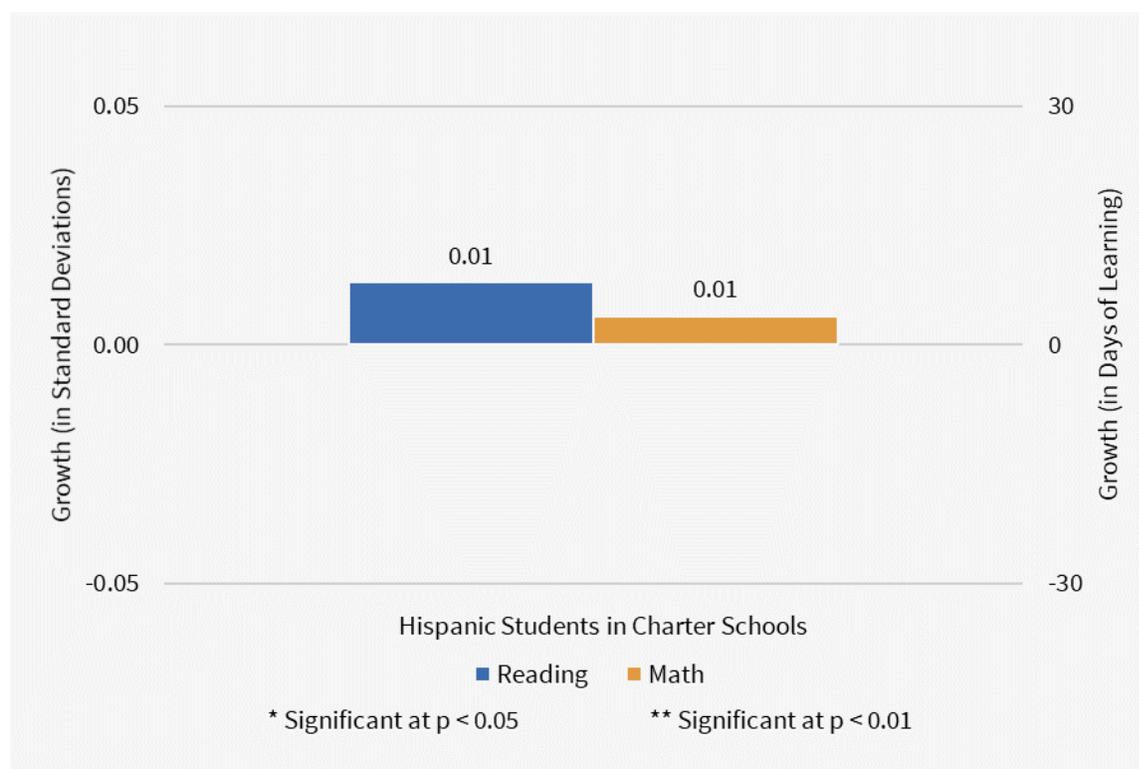


Figure 11a displays the relative differences in learning between Hispanic students enrolled in TPS and Hispanic students enrolled in charter schools. Hispanic students in charter schools show similar learning growth to Hispanic students attending traditional public school settings in both math and reading.

To summarize the race/ethnicity analyses, White students in charter schools post significantly higher academic progress than the average White TPS student in both reading and math. Black students in both charter schools and TPS make similar annual academic progress to the average White TPS student in reading and math. When we compare the progress of Black students across sectors, Black charter students post similar growth to that of Black TPS VCRs in both reading and math. Hispanic TPS and charter students post smaller gains in math, compared to the average White TPS student, while Hispanic TPS post weaker growth in reading as well. When the focus shifts to comparing the outcomes of Hispanic students by sector, Hispanic charter students are on a par with Hispanic TPS peers in both subjects.

The results indicate that charter school enrollment does not diminish learning for Black or Hispanic students. At the same time, we find that the overall positive learning gains in reading associated with charter attendance are primarily driven by the significantly higher learning gains of White charter students compared to White TPS VCRs. The overall not significant charter school impact on learning gains in math associated mask the positive impact

of charter attendance on the academic progress in math of White students, who represent 81 percent of the student population in charter schools in Idaho.

Charter School Impact for Students in Poverty

Many charter school operators expressly aim to improve educational outcomes for traditionally underserved students, especially for students in poverty. According to the latest data collected by the National Alliance for Public Charter Schools, students in poverty account for 55 percent of the national charter school population.¹⁷ In Idaho, 19 percent of charter school students are eligible for subsidized school meals, a proxy for low income households, compared to 27 percent of TPS students.

Our information on eligibility for subsidized school meals reflects Idaho's State Department of Education's information on eligibility confirmed through "Direct Certification." Direct certification involves matching school enrollment records against the most current available Supplemental Nutrition Assistance Program (SNAP), Temporary Assistance for Families in Idaho (TAFI), foster care data, or through several other allowable categorically eligible designations. Direct certification is a statutory mandate pursuant to Section 9 of the Richard B. Russell National School Lunch Act (NSLA) as amended by reauthorization legislation (Public Law 108-265). We recognize that several aspects of direct certification contribute to the estimated lunch eligibility being only loosely correlated with lunch eligibility estimated in the Child Nutrition Program reports.¹⁸

Figure 12 presents the annual academic growth for students in poverty. It is important to note that in this graph, the baseline differs from the race/ethnicity graphs presented earlier: it is a student who is not eligible for free or reduced price school meals in TPS.¹⁹ The study isolates the relationship between poverty and growth. This leaves a picture of the difference in the impact of charter attendance on students in poverty compared to similar students in TPS who are not in poverty. The bars on the right side of Figure 10 (-.05* for reading and -.08** for math) represent the impact of being a student in poverty and attending a charter school.²⁰ The bars on the left side of Figure 12 picture a TPS student in poverty. Both are compared to TPS students who are not in poverty, represented by the .00 line.

¹⁷ The data were retrieved from "National Charter School Facts," National Alliance for Public Charter Schools, <https://data.publiccharters.org/>, when the report was produced.

¹⁸ For additional information on Idaho's direct certification, please visit: <https://www.sde.idaho.gov/cnp/sch-mp/files/reference/direct-certification/Direct-Certification.pdf>

¹⁹ Eligibility for free or reduced-price lunch (FRL) has been used as an indicator of poverty in education research for decades. Although we acknowledge that FRL is not as sensitive as we would desire, FRL is currently the best available proxy for poverty.

²⁰ The learning gains for a charter student in poverty include both the gains associated with charter attendance and the gains associated with being in poverty.

Figure 12: Overall Learning Gains for TPS and Charter Students in Poverty Compared to Students Not in Poverty

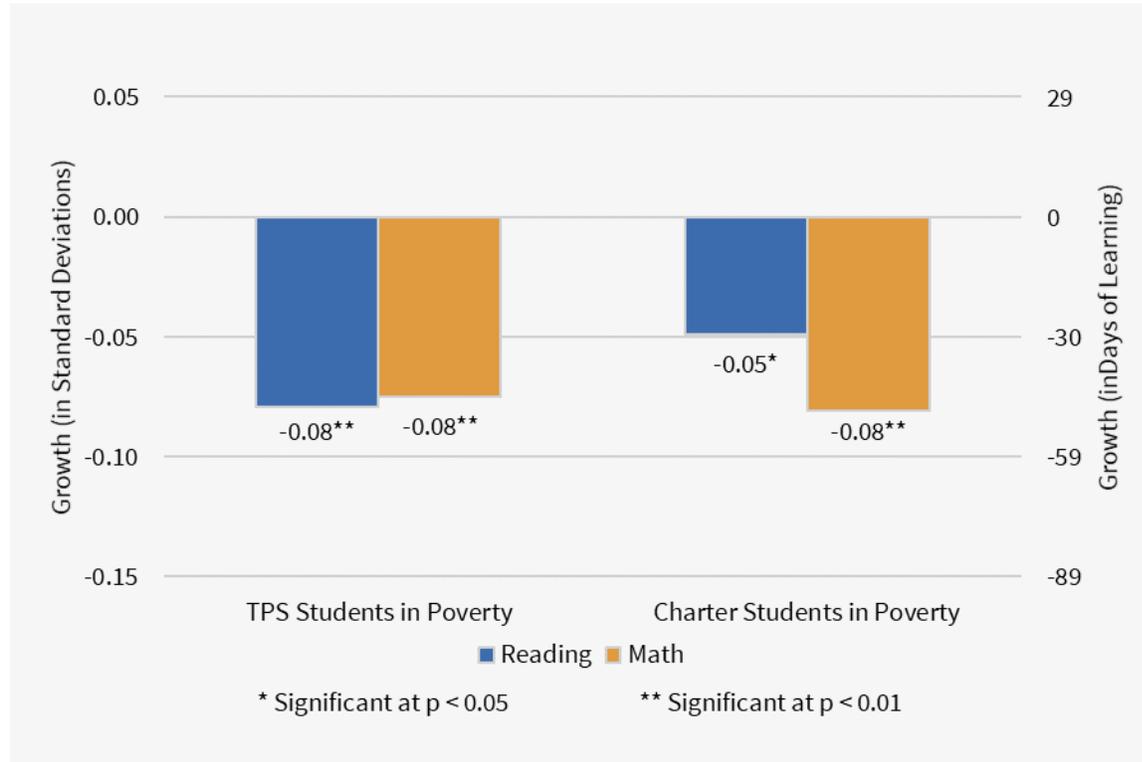


Figure 12a compares the growth of charter students in poverty versus their TPS peers. The results in Figure 12 suggest that student in poverty, regardless of whether they attend TPS or charter schools, significantly underperform TPS students not in poverty in both reading and math. TPS students in poverty make less academic progress than non-poverty TPS students by 47 days of learning in reading and 47 days of learning in math. Charter school students in poverty achieve less academic growth in reading compared to their non-poverty TPS students too, with the deficit amounting to 30 days of learning in reading and 47 days of learning in math. These results mean that learning gaps for charter and TPS students on the socio-economic status have persisted.

Figure 12a: Relative Learning Gains for Charter School Students in Poverty Benchmarked against Their TPS Peers in Poverty

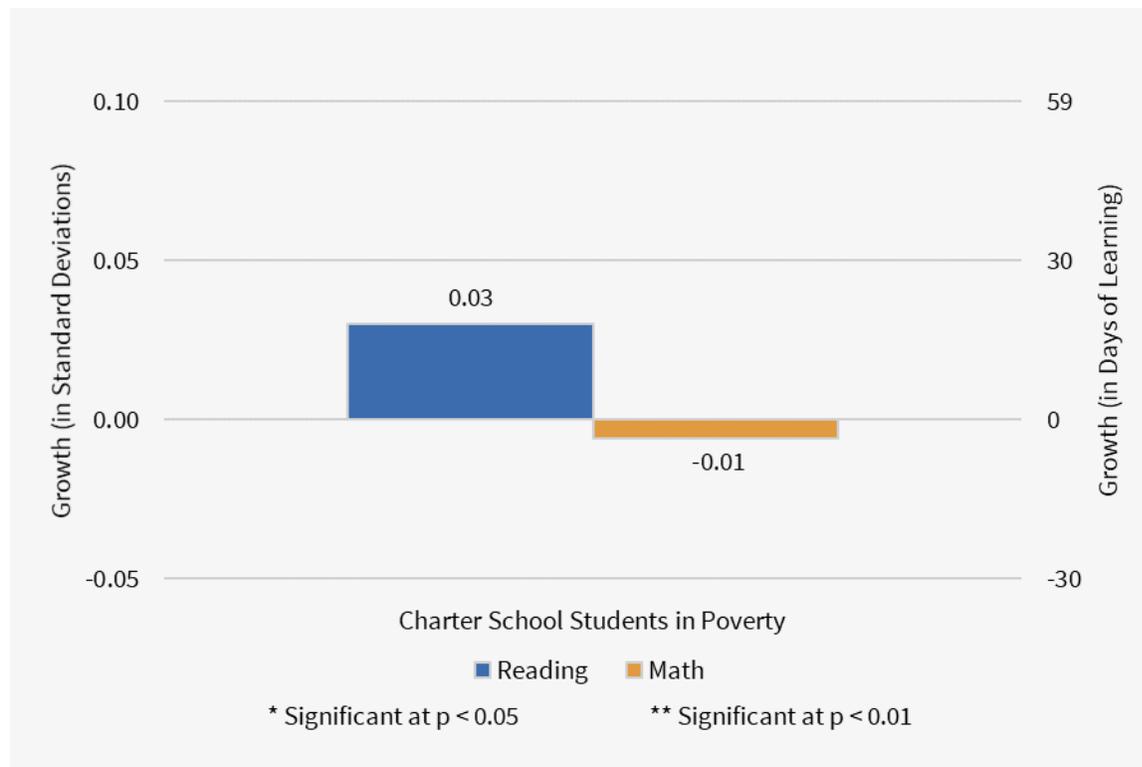


Figure 12a compares the growth of charter students in poverty versus their TPS peers. Charter school students in poverty make similar progress to TPS peers in poverty in both reading and math.

Charter School Impact for Students in Poverty by Race/Ethnicity

In public education, some of the most academically challenged students are those who are both living in poverty and also members of historically-underserved racial or ethnic minorities. These students represent a large subgroup, and their case has been the focus of decades of attention. Within the national charter school community, these groups receive special attention. To examine the extent to which gaps are being addressed in Idaho, we further disaggregate the charter school impact on students in poverty by different race/ethnicity groups. We benchmark the discussion by showing the impact of Idaho charter schools on the academic gains of White students living in poverty, presented in Figures 13 and 13a. Figures 14 and 14a show the academic progress of Hispanic students living in poverty. Small numbers of students prevent the same study of Blacks in poverty versus non-poverty Blacks.

Figure 13 compares White students living in poverty, enrolled in TPS or charter schools, with the average White TPS student who is not in poverty. The results show that White TPS students living in poverty make less academic progress annually in reading and math than White TPS students not living in poverty in Idaho. White charter students in poverty exhibit similar academic progress in reading and lower growth in math, compared to White

non-poverty TPS students. White TPS students in poverty exhibit approximately 53 fewer days of learning in reading and 47 fewer days of learning in math than White non-poverty TPS students. White charter students in poverty experience similar growth in reading compared to White non-poverty TPS students. White charter students in poverty experience 41 fewer days of learning in math than White non-poverty TPS students. When focusing on peer comparison as displayed in Figure 13a, we find that White charter students living in poverty make similar learning gains compared to their White TPS peers in poverty in both reading and math.

Figure 13: Learning Gains of White TPS and Charter Students in Poverty Compared to Learning Gains of White TPS Students Not in Poverty

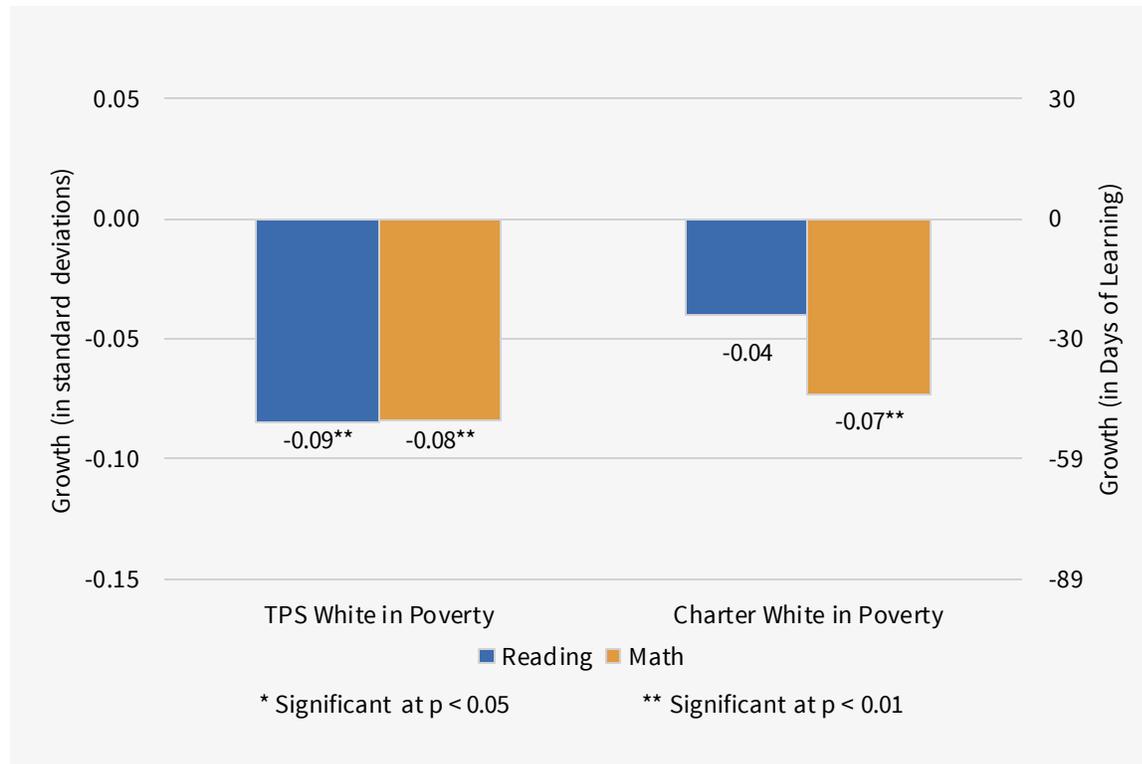


Figure 13a: Relative Learning Gains for White Charter School Students in Poverty Benchmarked against Their White TPS Peers in Poverty

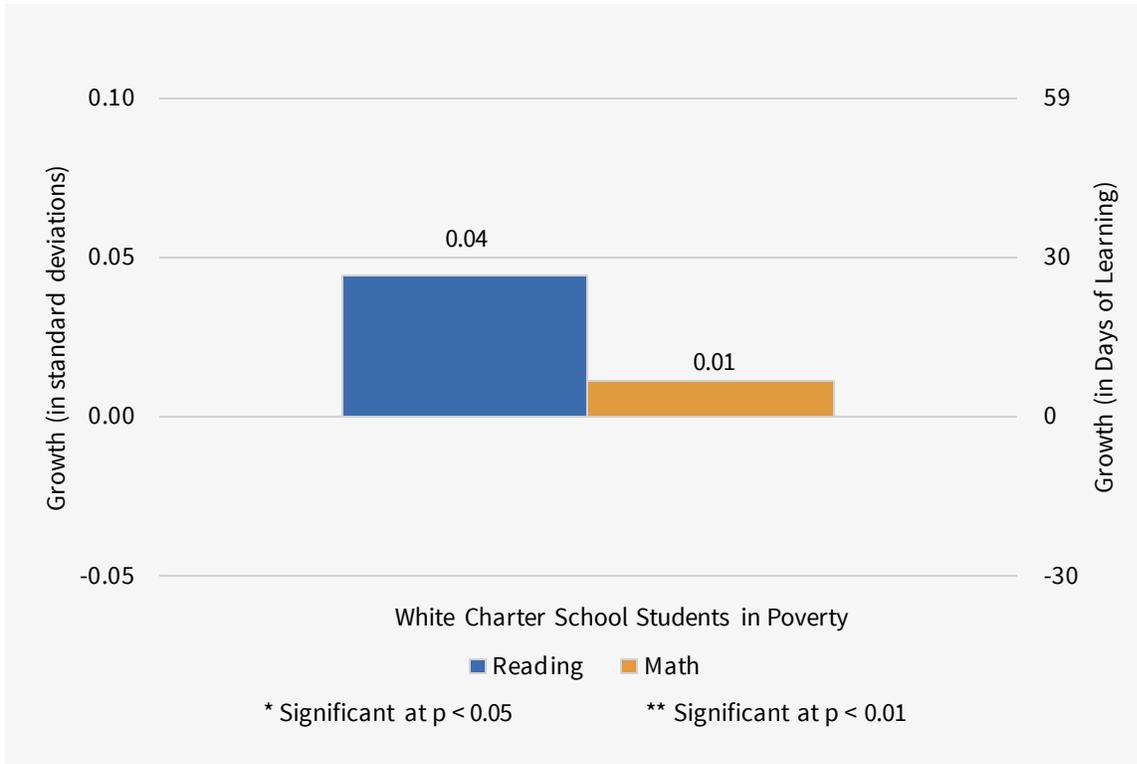


Figure 14: Learning Gains of Hispanic TPS and Charter Students in Poverty Compared to Learning Gains of White TPS Students Not in Poverty

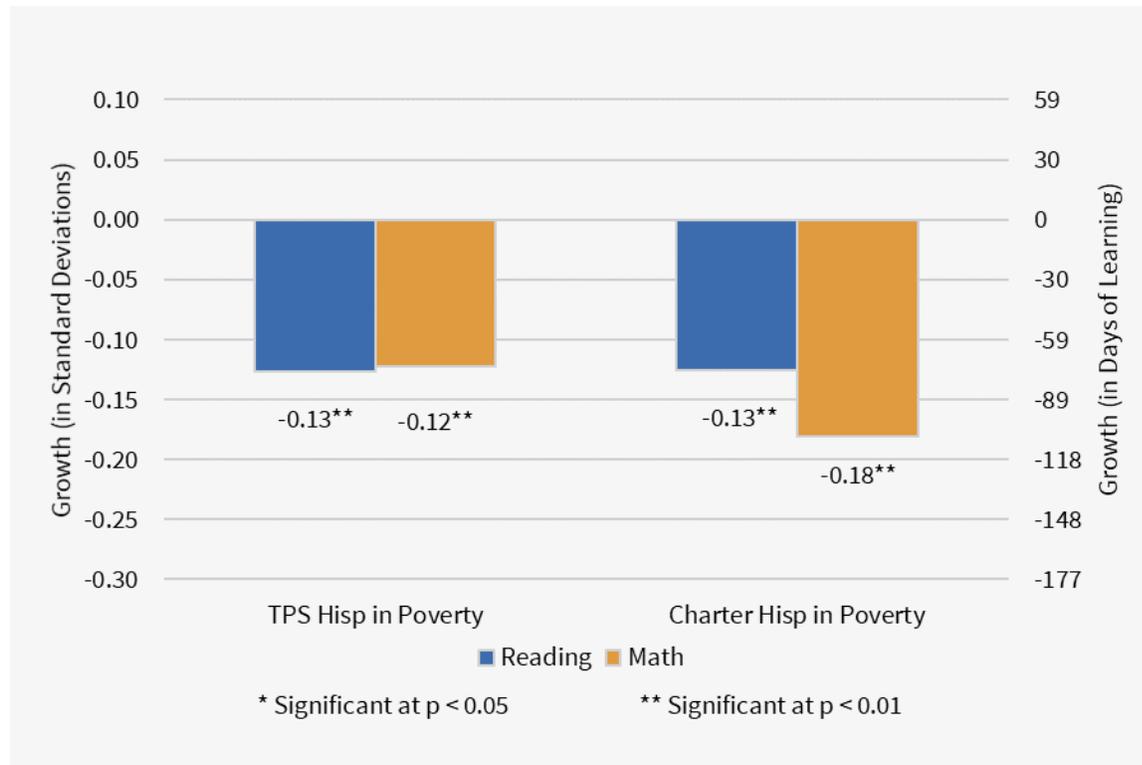
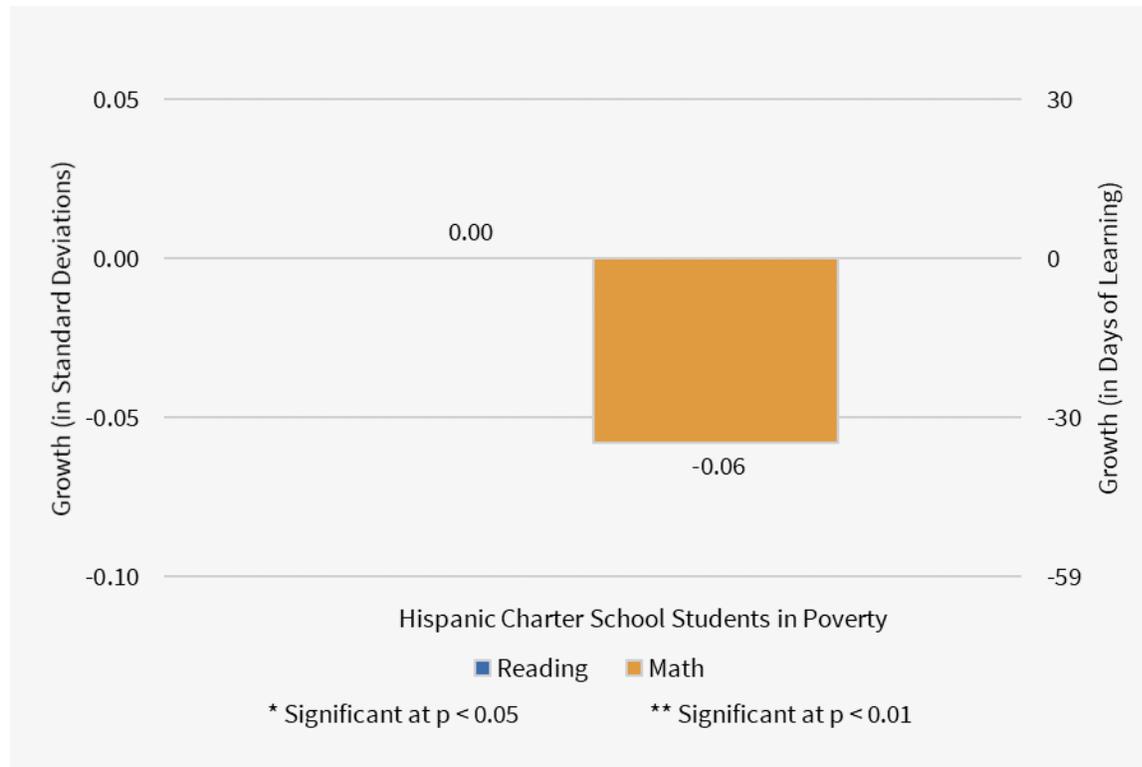


Figure 14 compares Hispanic students living in poverty, enrolled in TPS or charter schools, with the average White TPS student who is not in poverty. The patterns show that Hispanic students living in poverty, regardless of TPS or charter attendance, make less academic progress annually than White TPS students not living in poverty in Idaho. Hispanic TPS students in poverty exhibit approximately 78 fewer days of learning in reading and 71 fewer days of learning in math than White non-poverty TPS students. Hispanic charter students in poverty experience 78 fewer days of learning in reading and 106 fewer days in math than White non-poverty TPS students. When focusing on peer comparison as displayed in Figure 14a, we find that Hispanic charter students living in poverty make similar learning gains relative to their TPS peers in both reading and math.

Figure 14a: Relative Learning Gains for Hispanic Charter School Students in Poverty Benchmarked against Their Hispanic TPS Peers in Poverty



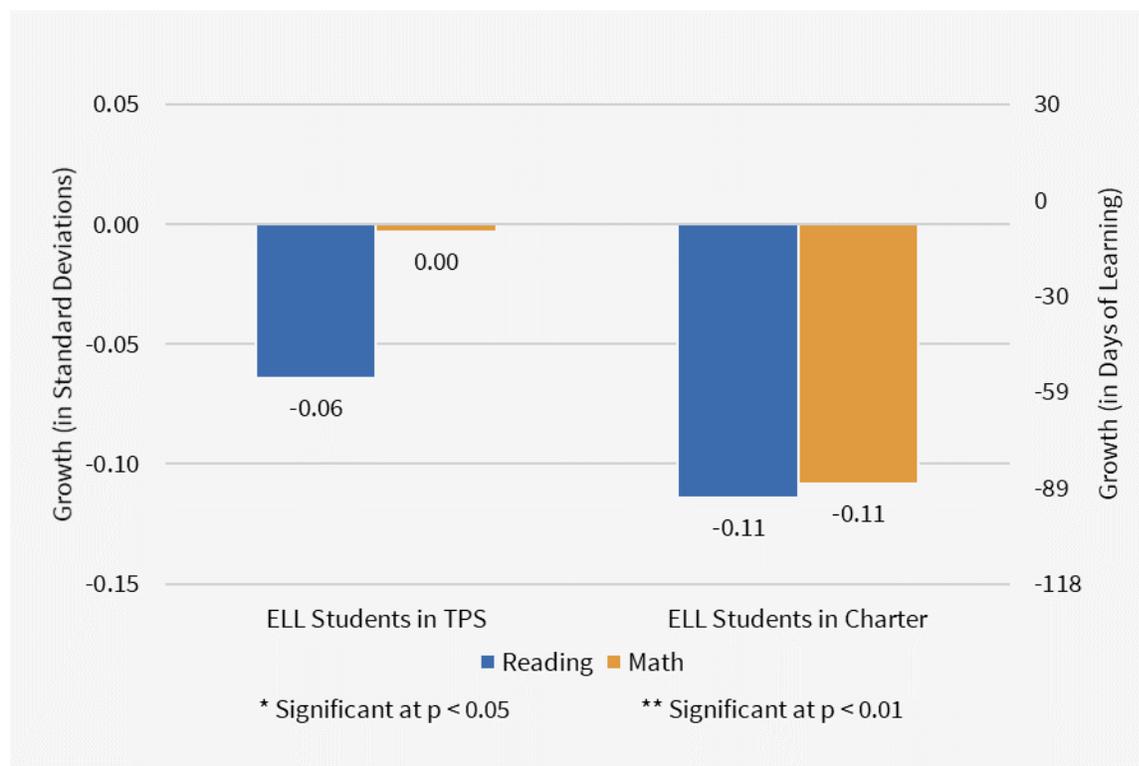
To summarize the findings illustrated in Figure 13 through Figure 14a, we find that the academic progress of White students in poverty, regardless whether they attend TPS or charter schools, lags behind the academic progress of White TPS students not living in poverty. The results suggest that the overall positive charter impacts shown in Figure 3 are chiefly driven by non-poverty White students.

At the same time, there are substantial learning gaps in both subjects for Hispanic students living in poverty, no matter whether they study in TPS or charter schools, compared to white non-poverty students in TPS. Charter attendance does not affect the learning gains of Hispanic students in poverty in either subject.

Charter School Impact for English Language Learners

There is a growing population of students enrolled in the public school system with a primary language other than English. Their present success in school will influence their progress in the future once they exit the school system. The 2017 National Assessment of Education Progress (NAEP) documented the performance gap between English language learners (ELL) and their English proficient peers, with ELL students having weaker performance.²¹ Even though the share of charter school students who are English Language Learners in Idaho is only 1 percent, demographic trends in the country point to larger shares over time. The analyses in Figure 15 and Figure 15a can provide important baselines for comparisons over time.

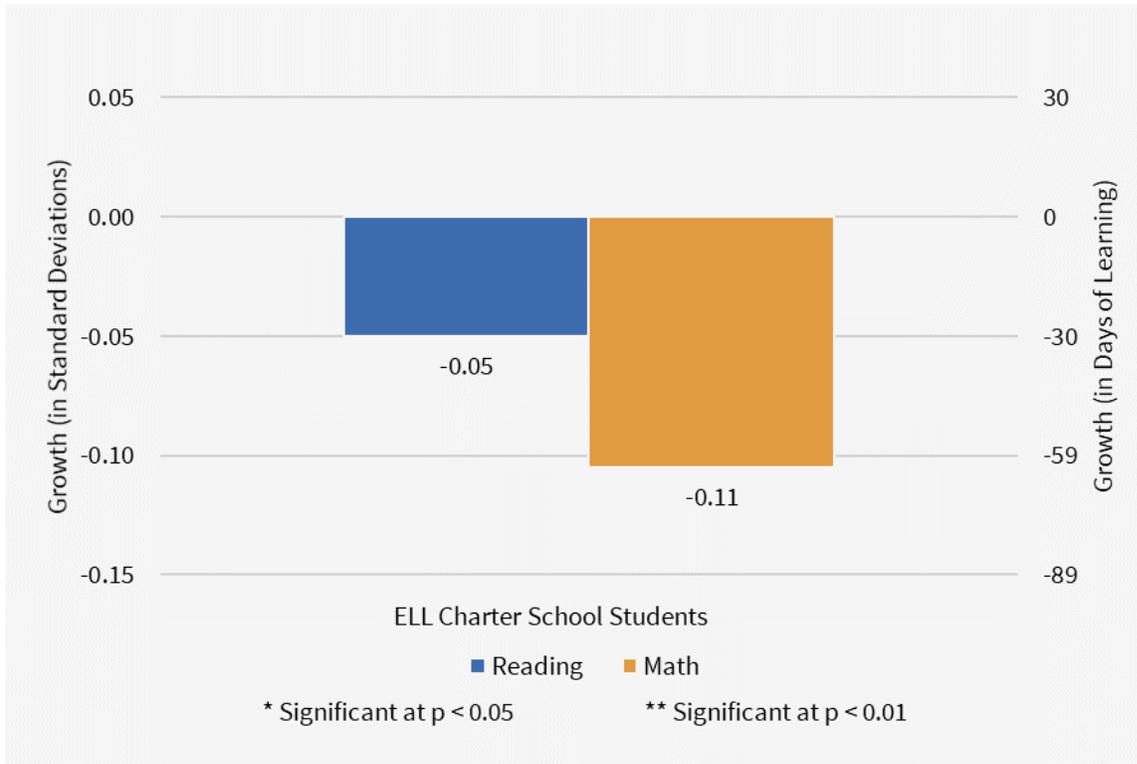
Figure 15: Learning Gains for TPS and Charter Students with ELL Designation Compared to Non-ELL TPS Students



The comparison student for Figures 15 is a TPS student who is English proficient. English language learners in TPS schools achieve comparable learning gains in both reading and math relative to non-ELL TPS students. Charter school students with ELL designation have no difference in reading and math gains compared to non-ELL TPS students. When the progress in ELL students is compared across school settings, as displayed in Figure 15a, charter ELL students post similar progress to their TPS ELL peers in both reading and math.

²¹ “National Student Group Scores and Score Gaps,” NAEP Mathematics Report Card, https://www.nationsreportcard.gov/math_2017/nation/gaps/?grade=4#?grade=4.

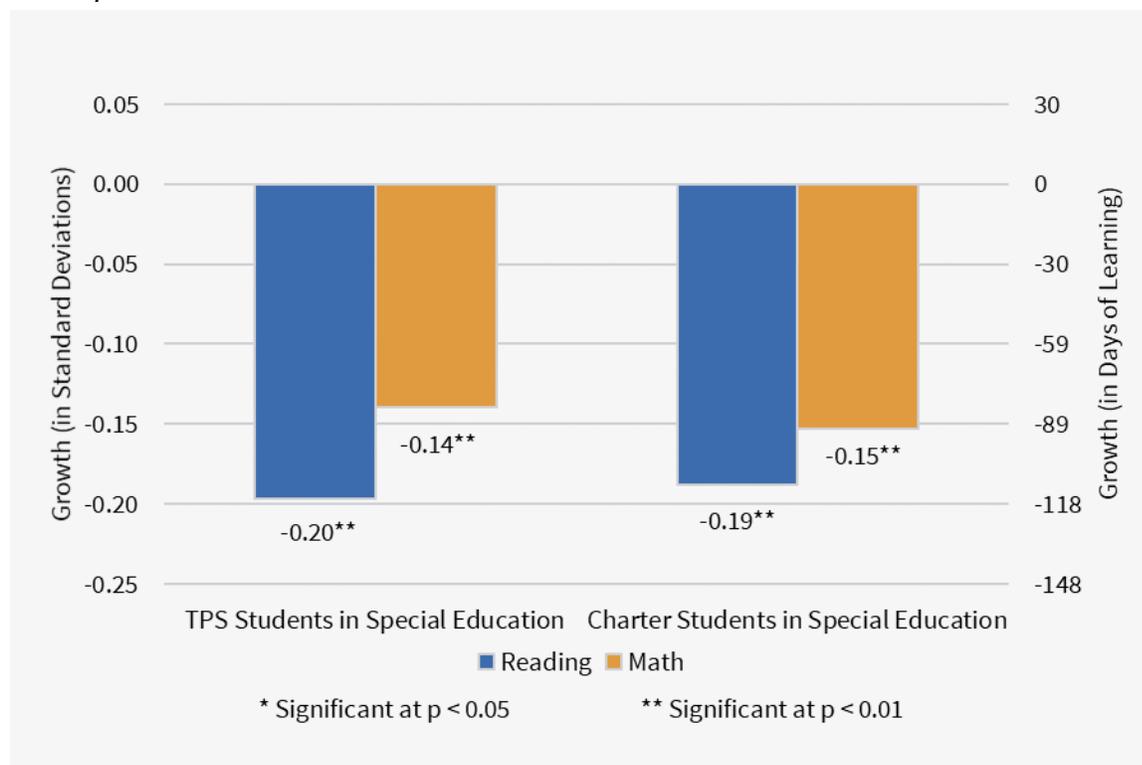
Figure 15a: Relative Learning Gains for ELL Charter School Students Benchmarked against Their ELL TPS Peers



Charter School Impact for Special Education Students

Because of the differences in individual needs, comparing the outcomes of special education students is difficult, regardless of where they enroll. In the ideal world, we would only compare students with the same Individual Education Program (IEP) designation, matching for it along with the rest of the matching variables. That approach faces real challenges, however, because of the large number of designations. The finer distinction leads to very small numbers of cases that match between charter schools and their feeder schools, which hinders the analysis. To obtain any estimates of charter school impacts for students with special education needs, it is necessary to aggregate across all IEP categories. It is important to consider this when viewing the results in Figure 16 and Figure 16a.

Figure 16: Overall Learning Gains for TPS and Charter Students in Special Education Compared to TPS Students Not in Special Education



In Figure 16, we firstly compare students in Special Education in TPS and charter to students in TPS not receiving Special Education services. Idaho special education students in both TPS and charter schools have significantly weaker academic growth than students in TPS who do not receive special education services. Figure 16 shows that TPS students in special education programs experience 118 fewer days of learning in reading and 83 fewer days of learning in math when compared to TPS students not receiving special education services. A special education student in charter schools also makes less progress than a non-special-education student in TPS, and

the gap is larger, reaching 112 fewer days of learning in reading and 89 fewer days in math. The second comparison is between charter students in Special Education and TPS students in Special Education.

Figure 16a contrasts the growth of special education students attending charter schools relative to their peers in TPS. Figure 16a shows that charter students in Special Education fare as well as their TPS VCRs in reading and math, as the differences are not statistically significant.

Figure 16a: Relative Learning Gains for Charter School Students in Special Education Benchmarked against Their TPS Peers in Special Education

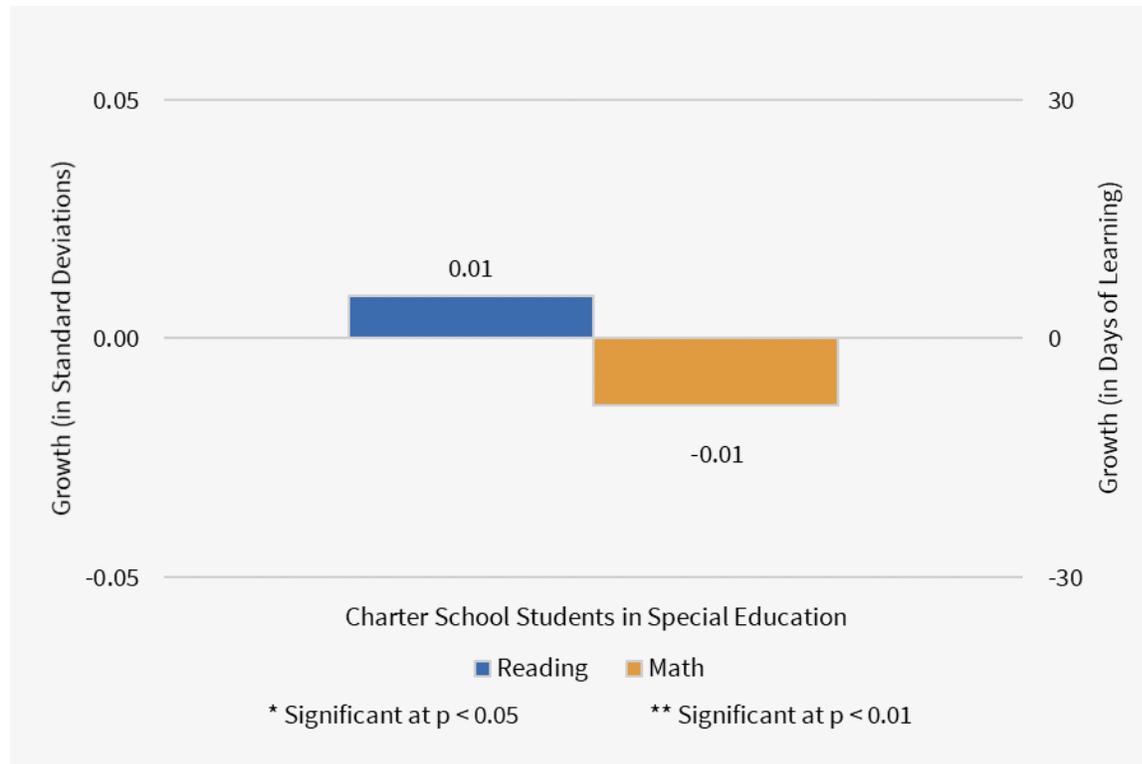


Table 7 summarizes the effect that charter schools have on student group populations. The coefficients represent the growth of each group relative to their counterpart group in TPS.

Table 7: Charter School Impact on Student Subgroup Performance

Student Group	Charter Effect on Student Groups Benchmarked against their TPS Peers	
	Reading	Math
Charter School Students in Poverty	0.03	-0.01
White Charter Students	0.04**	0.04*
Black Charter Students	-0.06	-0.03
Hispanic Charter Students	0.01	0.01
White Charter Students in Poverty	0.04	0.01
Hispanic Charter Students in Poverty	0.00	-0.06
Special Education Charter Students	0.01	-0.01
English Language Learner Charter Students	-0.05	-0.11
Overall Charter Effect	0.04**	0.03

* Significant at the 0.05 level, **Significant at the 0.01 level

Synthesis and Conclusions

In this study, we examine the academic progress of students in Idaho charter schools in a year's time compared to the gains of identical students in the traditional public schools the students otherwise would have attended. The study employs three years of annual data from 2014-15 to 2016-2017, in order to create two year-to-year measures of progress. The year-to-year measure is referred to as growth or gains. For the reader's convenience, the following table summarizes the key findings of this report.

Table 8: Summary of Statistical Significance of Findings for Idaho Charter School Students Benchmarked Against Comparable TPS Students

	Reading	Math
Idaho Charter Students	Positive	Similar
Students in Online Charter Schools	Similar	Negative
Students in Brick-and-Mortar Charter Schools	Positive	Positive
Students in Charters in 2015-16	Similar	Similar
Students in Charters in 2016-17	Positive	Similar
Students in Urban Charter Schools	Similar	Similar
Students in Suburban Charter Schools	Similar	Similar
Students in Town Charter Schools	Similar	Similar
Students in Rural Charter Schools	Positive	Positive
Students in Elementary Charter Schools	Similar	Similar
Students in Middle School Charter Schools	Negative	Negative
Students in High School Charter Schools	Similar	Similar
Students in Multi-level Charter Schools	Positive	Similar
First Year Enrolled in Charter School	Similar	Similar
Second Year Enrolled in Charter School	Similar	Similar
White Charter School Students	Positive	Positive
Black Charter School Students	Similar	Similar
Hispanic Charter School Students	Similar	Similar
Special Education Charter School Students	Similar	Similar
English Language Learner Charter School Students	Similar	Similar
Charter Students in Poverty	Similar	Similar
White Charter Students in Poverty	Similar	Similar
Hispanic Charter Students in Poverty	Similar	Similar

On average, students in Idaho charter schools experience similar learning gains in math and stronger growth in reading in a year than their TPS peers. The advantage in reading for charter students is as if the students obtained 24 additional days of learning in a school year.

Beyond the overall results, the analysis probes the consistency of charter school performance in Idaho over many dimensions. Urban, suburban and town charter school students grow similarly to their TPS peers in both reading and math. Students enrolled in rural charter schools have stronger gains in both reading and math compared to their TPS virtual twins.

Comparison of charter performance by grade span shows that students in Idaho charter elementary and high schools exhibit similar growth in reading and math compared to their TPS peers. Charter multi-level school students show similar progress in math, while they gain an edge over their TPS peers in reading. However, students in charter middle schools experience weaker growth in reading and math than their TPS peers.

In Idaho, there are different types of operation for charter schools. Online and brick-and-mortar charters have distinct physical or geographic boundaries, student profiles, and means of curriculum delivery. Our investigation reveals remarkably weaker growth in both reading and math among online charter students relative to the average TPS students or brick-and-mortar charter students. In fact, it is the poor performance of online charter schools that drags down the overall charter impact on student academic growth.

The learning gains associated with charter school attendance vary across different demographic subgroups. White charter students post higher academic growth than their White virtual twins in TPS. On the other hand, Black and Hispanic students obtain similar learning gains in both subjects as compared to their respective virtual twins in TPS. Attendance in charter schools produces similar learning gains in both subjects to TPS attendance for students living in poverty. White and Hispanic students in poverty post gains in reading and math equivalent to those of their respective TPS virtual twins. Charter English language learners experience similar learning in reading and math and charter special education students are on par in both subjects compared to their peers enrolled in TPS. When we compare the overall positive charter impacts on White students with the results of non-positive charter impacts on the academic progress of non-White students and students in poverty, we conclude that charter attendance in Idaho is associated with higher academic progress for more traditionally advantaged student populations.

Looking at the results at the school level, around 40 percent of Idaho charter schools outpace their local TPS peers in learning in reading and math. Still, 17 percent of charter schools have results that are significantly worse than TPS for reading and 20 percent of charter schools are underperforming in math relative to their local TPS peers.

The student-to-student and school-to-school results show charter schools to be either ahead or on a par with TPS. The complementary question of whether charter schools are helping students achieve at high levels is also important. More than 75 percent of charter schools in Idaho fall above the 50th percentile in achievement in both reading and math. These outcomes are of course influenced by locational decisions and the starting points of the students they serve. In addition, 71 percent of charter schools have positive academic growth in reading and 61 percent of charter schools have positive academic growth in math irrespective of achievement. Some schools below the 50th percentile of achievement have positive growth in reading and math. With positive and sustained growth, these schools will likely post achievement gains over time. However, the outlook for a considerable

proportion of charter schools with below-average growth and low achievement (20 percent for reading and 24 percent for math) is a source of great concern in Idaho. Students in these schools will fall further behind their TPS peers in the state academically over time if their negative growth persists.

In the 2014-15 school year, a new assessment was administered in Idaho, namely the Smarter Balanced Assessment. Only three years of student performance data are available under this new assessment. It will be worth to continue examining the performance of charter schools in a wider time window with future updates of our study. In the meantime, there are promising examples of stronger performance that are worth attention as well as examples where concern is warranted.

APPENDICES

Appendix A: Sample Size in Each Subgroup

The numbers in the table below represent the number of charter observations associated with the corresponding results in the report. An equal number of VCRs were included in each analysis.

Appendix Table 1: Number of Observations for All Results

Student Group	Matched Charter Student Records	
	Reading	Math
Idaho Charter Students Tested & Matched	14,915	14,814
Students in Charters in 2015-2016	7,113	7,024
Students in Charters in 2016-2017	7,802	7,790
Students in Urban Charter Schools	3,421	3,402
Students in Suburban Charter Schools	5,745	5,704
Students in Town Charter Schools	1,898	1,893
Students in Rural Charter Schools	3,851	3,815
Students in Elementary Charter School	4,413	4,368
Students in Middle School Charter Schools	365	369
Students in High School Charter Schools	518	529
Students in Multi-level School Charter Schools	9,619	9,548
Students in First Year Enrolled in Charter School	3,233	3,224
Students in Second Year Enrolled in Charter School	783	781
Students in Online Charters	2,592	2,565
Students in Brick-and-Mortar Charters	12,323	12,249
Black Charter School Students	28	24
Hispanic Charter School Students	1,338	1,323
White Charter School Students	13,217	13,140
Charter School Students in Poverty	2,175	2,168
Hispanic Charter School Students in Poverty	380	376
Special Education Charter School Students	905	896
English Language Learner Charter School Students	76	77
Grade Repeating Charter School Students	11	18

Appendix B: Technical Appendix

Source of Student-Level Data

For the purpose of this study, student-level data were provided by Idaho's Office of State Board of Education (OSBE). CREDO has no power to audit or control the quality of records held by OSBE. Therefore, we recognize that there is a level of data specificity that is beyond the means CREDO can control.

Demographic Composition of Charter Students in the Study

This study examines the performance of students in charter schools who participated in annual accountability testing in Idaho, occurring in grades 3-8, 11 and in whatever grade the end-of-course assessments were taken. The test scores allow us to use a common measure of performance across schools and over time. However, in each growth period of the study, students who are enrolled in non-tested grades are not included in the analysis of performance. This partially accounts for the differences in school and student counts in our analysis data compared to other published figures about the charter school population in Idaho.

As discussed in the Study Approach section, we match tested charter students by period if they can be tracked for two or three periods in the study so as to conform to the new baseline equivalence requirement in the *Procedures Handbook Version 4.0 of What Works Clearinghouse*. Appendix Tables 2-3 present the student profiles across all and across matched Idaho charter students tested in math in each matching period.

Appendix Table 2: Demographic Composition of Charter Students in the Study: Period 1

Student Group	All Charter Students Tested		Matched Charter Students	
	Number	Percent	Number	Percent
Idaho Charter Students	12,318		10,378	
% Matched	84%			
Black Students	96	1%	13	0%
Hispanic Students	1,275	10%	952	9%
White Students	10,274	83%	9,186	89%
Students in Poverty	2,058	17%	1,601	15%
Special Education Students	1,092	9%	641	6%
English Language Learners	105	1%	56	1%
Grade Repeating Students	174	1%	18	0%

Appendix Table 3: Demographic Composition of Charter Students in the Study: Period 2

Student Group	All Charter Students Tested		Matched Charter Students	
	Number	Percent	Number	Percent
Idaho Charter Students	5,388		4,436	
% Matched	82%			
Black Students	46	1%	11	0%
Hispanic Students	498	9%	371	8%
White Students	4,562	85%	3,954	89%
Students in Poverty	764	14%	567	13%
Special Education Students	445	8%	255	6%
English Language Learners	37	1%	21	0%
Grade Repeating Students	38	1%	0	0%

Note: Appendix Tables 2 and 3 refer to every student who tested in Math.

Comparison of Starting Scores of Matched Students and VCRs

The VCR method used in this study of Idaho provided matches for 84 percent of tested charter students with growth scores in reading or math. To assess the quality of the matches, we compare the starting scores of matched charter students and the Virtual Control Records obtained from the matches in both reading and math. The statistical tests of equality of means are shown in Appendix Figures 1 and 2 for math and reading, respectively. We find that the starting scores of matched students and the “virtual twins” used as points of comparison are almost identical. As matched students and their “virtual twins” have identical starting points in terms of learning in the beginning of a growth period, we can be confident that any difference in their final scores and therefore their learning growth can be attributed to charter school attendance, as the only observed way in which matched students and VCRs differ is that the former attend a charter school while the latter consist of students attending a traditional public school.

Appendix Figure 1: Comparison of Starting Math Scores of Matched Charter Students and VCRs

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
TPS	14,814	.2853061	.0074589	.9078481	.2706856	.2999265
Charter	14,814	.2858377	.0074831	.9107889	.2711699	.3005055
combined	29,628	.2855719	.0052827	.9093044	.2752175	.2959263
diff		-.0005316	.0105656		-.0212407	.0201775

diff = mean(TPS) - mean(Charter) t = -0.0503
 Ho: diff = 0 Welch's degrees of freedom = 29627.7

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.4799 Pr(|T| > |t|) = 0.9599 Pr(T > t) = 0.5201

Appendix Figure 2: Comparison of Starting Reading Scores of Matched Charter Students and VCRs

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
TPS	14,915	.281179	.0074765	.9130844	.2665241	.2958339
Charter	14,915	.2819089	.0075	.9159515	.267208	.2966098
combined	29,830	.2815439	.0052949	.9145038	.2711657	.2919222
diff		-.0007299	.01059		-.0214868	.020027

diff = mean(TPS) - mean(Charter) t = -0.0689
 Ho: diff = 0 Welch's degrees of freedom = 29829.7

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = 0.4725 Pr(|T| > |t|) = 0.9451 Pr(T > t) = 0.5275

Measuring Academic Growth

With three years of data, each subject-grade-year group of scores has slightly different mid-point averages and distributions. For end-of-course assessments (EOCs) there are only subject-year groups because EOCs are not grade specific. This means a student takes this assessment after completing the course, no matter what grade he is in. In our study, scores for all these separate tests are transformed to a common scale. All test scores have been converted to standardized scores to fit a "bell curve", in order to allow for year-to-year computations of growth.²²

²² For each subject-grade-year set of scores, scores are centered around a standardized midpoint of zero, which corresponds to the actual average score of the test before transformation. Then each score of the original test is

When scores are standardized, every student is placed relative to their peers in the entire state of Idaho. A student scoring in the 50th percentile in Idaho receives a standardized score of zero, while a standardized score of one would place a student in the 84th percentile. Students who maintain their relative place from year to year would have a growth score of zero, while students who make larger gains relative to their peers will have positive growth scores. Conversely, students who make smaller academic gains than their peers will have negative growth scores in that year.

Model for the Analysis of the Academic Impact of Charter Schools

After constructing a VCR for each charter student, we then set out to develop a model capable of providing a fair measure of charter impact. The National Charter School Research Project provided a very useful guide to begin the process²³. First, it was useful to consider student growth rather than achievement. A growth measure provided a strong method to control for each student's educational history as well as the many observable differences between students that affect their academic achievement. The baseline model included controls for each student's grade, race, gender, free or reduced price lunch status, special education status, English language learner status, and whether he was held back the previous year. The literature on measuring educational interventions found that the best estimation techniques must also include controls for baseline test scores.²⁴ Each student's prior year test score is controlled for in our baseline model. Additional controls are also included for year, and period (first year in charter, second year in charter, etc.). The study's baseline model is presented below.

$$\Delta A_{i,t} = \theta A_{i,t-1} + \beta X_{i,t} + \rho Y_t + \gamma C_{i,t} + \varepsilon_{i,t} \quad (1)$$

where the dependent variable is

$$\Delta A_{i,t} = A_{i,t} - A_{i,t-1} \quad (2)$$

and $A_{i,t}$ is the state-by-test z-score for student i in period t ; $A_{i,t-1}$ is the state-by-test z-score for student i in period $t - 1$; $X_{i,t}$ is a set of control variables for student characteristics and period; Y_t is a year fixed effect; C is a vector of variables for whether student i attended a charter school and what type of charter school in period t ; and ε is the error term. Errors are clustered around charters schools and their feeder patterns as well. The parameters of interest are estimated using Ordinary Least Squares (OLS) in STATA 14.

recast as a measure of variation around that new score of zero, so that scores that fall below the original average score are expressed as negative numbers and those that are higher receive positive values.

²³ Julian Betts and Paul Hill, "Key Issues in Studying Charter Schools and Achievement: A Review and Suggestions for National Guidelines," National Charter School Research Project, White Paper Series No. 2, May 2006.

²⁴ Julian Betts and Y. Emily Tang, "The Effect of Charter Schools on Student Achievement: A Meta-Analysis of the Literature," National Charter School Research Project, May 2006.

The baseline model above was extended to explore additional interactions beyond a simple binary to indicate charter enrollment. One type of extension included both “double” and “triple” interactions between the charter variable and student characteristics. For example, to identify the impact of charter schools on different racial groups, we estimate models that break the charter variable into “charter_black,” “charter_hispanic,” etc. To further break down the impact of charters by race and poverty, the variables above were split again. For example, black students in charter schools are split further into students that qualify for free or reduced price lunches (“charter_black_poverty”) and those that do not (“charter_black_nonpoverty”).

Presentation of Results

In this report, we present the impacts of attending charter schools in terms of standard deviations. The base measures for these outcomes are referred to in statistics as z-scores. A z-score of 0 indicates the student’s achievement is average for his or her grade. Positive values of the effect size represent higher performance while negative values represent lower performance. Likewise, a positive effect size value means a student or group of students has improved relative to the students in the state taking the same exam. This remains true regardless of the absolute level of achievement for those students. As with the z-scores, a negative effect size means the students have on average lost ground compared to their peers.

It is important to remember that a school can have a positive effect size for its students (students are improving) but still have below-average achievement. Students with consistently positive effect sizes will eventually close the achievement gap if given enough time; however, such growth might take longer to close a particular gap than students spend in school.

While it is fair to compare two effect sizes relationally (i.e., 0.08 is twice 0.04), this must be done with care as to the size of the lower value. It would be misleading to state one group grew twice as much as another if the values were extremely small such as 0.0001 and 0.0002.

Finally, it is important to consider whether an effect size is significant or not. In statistical models, values which are not statistically significant should be considered as no different from zero. Two effect sizes, one equal to .001 and the other equal to .01, would both be treated as no effect if neither were statistically significant.

To assist the reader in interpreting the meaning of effect sizes, we include an estimate of the average number of days of learning required to achieve a particular effect size. This estimate was calculated by Dr. Eric Hanushek and Dr. Margaret Raymond based on the latest (2017) 4th and 8th grade test scores from the National Assessment of Educational Progress (NAEP). Using a standard 180-day school year, each one standard deviation (s.d.) change in effect size was equivalent to 590 days of learning in this study. The values in Table 3 are updated from past reports using more recent NAEP scores, which show slower absolute annual academic progress than earlier administrations.²⁵

²⁵ Hanushek, Peterson, and Woessmann, “Achievement Growth: International and U.S. State Trends in Student Performance.”