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COLORADO DEPARTMENT *of* EDUCATION

Characteristics of Colorado's Online Students

By:
Amanda Heiney, Dianne Lefly and Amy Anderson

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Executive Summary

Over 16,000 Colorado students attend an online public school—a school choice that is valued by many families across our state. However, as the number of students attending online schools has grown and changed over the years, interest and questions about online schools from policymakers, media, and the general public has piqued. This study sets out to answer some of these questions. It utilizes Colorado Department of Education (CDE) collected data to analyze demographics, trends, and performance in online schools over time. It includes assessment, pupil enrollment, demographic and socioeconomic data collected from 2003 through 2011, as this is both the earliest and most recent data available from CDE at the student level. While some parts of the study examine data across all of these years, other parts look at cohorts of students enrolled within only certain years within this timeframe.

This study focused on only those students who were enrolled in full-time online schools. Online schools may be district or charter-managed, must have their own administration and school code, and are held to the same state standards of accountability as any public school. In 2003, there were only nine online schools in Colorado, with a total pupil enrollment of 3248; 82% were white, 7% were socioeconomically disadvantaged (qualified for free or reduced price lunch), and 50% were elementary (K-5) students. By 2011, a smaller percentage of online students were white (61%), a much greater percentage were socioeconomically disadvantaged (38%), and more than half (52%) were high school (9-12) students (and only 27% were elementary students).

General findings are organized across three main sections of the report, each of which represents online students in different stages of their learning:

> 1) The Early Years (Grades K-3);
>
> 2) The Primary & Formative Years (Grades 3-9); and
>
> 3) Secondary Success & Postsecondary Readiness (Graduates and Dropouts)

The Early Years

Important findings from this study about the youngest students enrolled in Colorado's online schools include the following:

1. The total number of online students enrolled in early grades has grown over time; however, a smaller overall percentage of elementary school-aged students are enrolled in online schools today as compared to the past (enrollment of online secondary students has spiked).

2. Students attending online schools in grades K-3 changed schools more frequently than their non-online peers: less than 25 percent of online students remained in the same school for four years as compared to 45 percent of students in brick-and-mortar schools who remained in the same school over the same time period.

3. The Colorado Basic Literacy Act (CBLA)[i] assessments that are used to detect early literacy levels are not being used properly in online schools. A higher percentage of students in online schools are being classified as on-grade level in K-3 yet score below proficient on the state reading assessment in 3rd grade. This sets online students up for a rougher road ahead than the typical Colorado student, as students who are non-proficient in reading in 3rd grade tend to remain below grade level over time.

4. Elementary-aged students in online schools consistently performed below their non-online peers in reading and math assessments.

Given the findings from this study, online schools should consider making changes to how they teach and assess students' basic skills in the early years. Research[ii] tells us that children who are behind in reading when they are in third grade are likely to continue to struggle as they move from the stage of 'learning to read' to 'reading to learn' in fourth grade and beyond. Colorado's new literacy law, the READ Act, is designed to address this problem. Given the findings from this study, it is likely that online schools will face some of the consequences of the READ Act[iii] at higher levels than their peers in brick-and-mortar schools.

The Primary & Formative Years

Key findings from this study about students enrolled in grades 3-9 in Colorado's online schools include the following:

1. While the primary focus of this study was on online students, upon doing some comparative analysis, interesting findings relative to all students were also revealed (online and brick-and-mortar students combined). Specifically, this research confirms the findings that led to the creation of the READ Act in 2012. Among those in our sample, whether attending online schools or brick-and-mortar schools, all students have a very high chance of never attaining reading proficiency if proficiency is not achieved in the early grades (by 3rd grade). In two separate representative samples taken of students in 2009 and 2011, nearly 70% of students who were non-proficient in 3rd grade were still non-proficient in 9th grade on the state assessment.

2. Students who attend multiple schools during their academic career perform worse, on average, than students who have attended fewer schools. The impact of this finding is greater for online schools because students entering online school s in 9th grade are enrolling having attended more schools, on average, than students entering high school in brick-and-mortar schools.

3. More than half of incoming 9th grade online students are enrolling in an online school for the first time. Of incoming 9th graders were in online schools previously, fewer than 10% had been enrolled in an online school for four years or more. However, this small percentage of students who remained enrolled in an online school for four years or more performed comparably to and sometimes better, on average, than all 9th graders statewide. This finding demonstrates that online schools are a good option for some students, in particular those who remain enrolled in an online school for multiple years.

Secondary Success & Postsecondary Readiness

Key Findings:

1. Overall, online schools' graduation rates are much lower than graduation rates statewide and have been so consistently. In 2003-04, the graduation rate for online schools was 39% compared to the statewide rate of 82.5%. In 2010-11, the online school graduation rate was 22.5%, whereas the statewide rate was 74%. Dropout rates for online schools have also been much higher than the statewide rates. In 2010-11, the dropout rate for online schools was 13%, while the statewide rate was 3%[iv]. While more erratic than statewide rates, online school dropout rates have consistently been in the double digits.

2. A greater percentage of white students enrolled in online schools drop out than the statewide average. Of online dropouts in 2010-11, 65% were white while less than 40% of the statewide dropouts were white. However, a smaller percentage of online Hispanic students dropout as compared to the percentages statewide. Only 26% of online dropouts were Hispanic, while almost 50% of dropouts statewide were Hispanic.

3. A higher percentage of female students drop out of online schools than the percentage statewide in 2010-11. Female dropouts comprised 56% of online dropouts, whereas only 44% of statewide dropouts were female. However, on the flip side, a greater percentage of females graduate from online schools, as compared to the statewide average. Female students comprised 51% of graduates statewide, but in online schools, 60% of graduates were females.

4. In 2010-11, online schools had a higher percentage of dropouts in the lower grade levels than statewide dropouts. Students in grades 11 and 12 accounted for 68% of dropouts statewide, but in online schools 56% of dropouts were in 11th and 12th grade. Of dropouts in online schools, 11% were 7th and 8th graders while only 6% of statewide dropouts were in the 7th and 8th grades.

5. A greater percentage of students are seeking an online school as their last school option before dropping out. In 2010-11, 59% of online dropouts had transferred from another Colorado district or

school within months of dropping out. Conversely, of dropouts statewide, 34% transferred from another district or school within months of dropping out. However, while there are a number of students entering online schools as their last option before dropping out, there are also a number who are choosing an online school as the school they graduate from--of online graduates, 44% of graduates had transferred from another Colorado district or school within months of graduating as compared to only 6% of graduates statewide who had just transferred from another Colorado district or school in the months prior to graduating. Both online and statewide dropouts had attended more schools on average than graduates.

Recommendations

1. Early and accurate identification of struggling students coupled with swift and targeted interventions is critical in the early years (K-3). Given poor performance of online students in the early years, leading to lower performance throughout their academic career, online schools need to identify more accurate measures of assessing students and utilize more effective interventions in the earliest grades in order to put their students on a track to be successful over time.

2. Due to the negative impact on student performance and success associated with attending numerous schools, parents should find the best school options for their children and keep them there for as long as possible to avoid enrolling their children in multiple schools outside of typical matriculation (e.g. elementary to middle school to high school). Similarly, schools and districts should consider a student's history, including the number of schools they have attended, before recommending expulsion or transfers. If an atypical school change is necessary, a long-term educational setting (online or otherwise) that is a good fit for the student needs to be identified.

3. The State should consider developing an "Early Warning System" that flags students who demonstrate characteristics which may result in low academic performance or a higher risk of dropping out. This data could then be shared with students' districts and schools so they may take

appropriate action. Based on the data from this study, individual student mobility and poor performance in the early grades could be measures used to identify such students.

4. Many students are choosing online schools for a short period of time or as a last option before dropping out. Some are successful and this is exactly the option they need in order to graduate; however, more are unsuccessful than successful.   As such, schools enrolling these students need to match the programs and services they offer in order to better meet the needs of the students they are enrolling.

5. Colorado may want to consider a different funding model for both online and brick-and-mortar students. As student mobility increases, it does not make sense to fund schools and districts based on a single, narrow count window at the beginning of the school year. Many districts and schools are funded for students who may not remain at the school following the count period, and the schools who serve these students for the remainder of the school year do not receive any funding for these students.

Introduction

Student enrollment in online schools has changed over time. This section of the study discusses the growth and changes that have occurred in pupil enrollment, demographics and socioeconomic trends in online schools from 2003-04 through 2011-12. Pupils enrolled in full-time online schools were included in this study. Online schools in Colorado are full-time, sequential schools with their own school code, administration, budget and accountability. There are two types of online schools that exist in Colorado, multi-district and single-district. Multi-district online schools may enroll any students who are Colorado residents, regardless of geographic location in the State. Single-district online schools may only enroll students who are residents of the district in which the online school is located.

Online schools are different from online programs. Online programs are typically small (cannot exceed 100 students) and housed within other schools or district configurations (e.g., credit recovery programs within a high school). Because these programs do not have a school code or achievement data unique to the online program (because their achievement data is rolled up to the school or district in which they are housed), they are not included in this study.

Public online schools and programs have existed in Colorado since 1996 when the Monte Vista School District started its online pilot school. As online schools became an acceptable, and many times preferable, educational option for many families, more and more districts began opening their own online schools. Online legislation and the establishment of the Unit of Online Learning at CDE occurred in 2007, lending further legitimacy to online learning in the state of Colorado. The number of online schools (both multi-district and single-district) increased from nine schools in 2003 to 35 schools in 2011, while pupil enrollment ballooned from 3248 students in 2003 to 16,464 students in 2011. Chart 1 shows the increase in pupil enrollment over this time period.

Chart 1: Pupil Enrollment in All Online Schools from 2003-04 through 2011-12
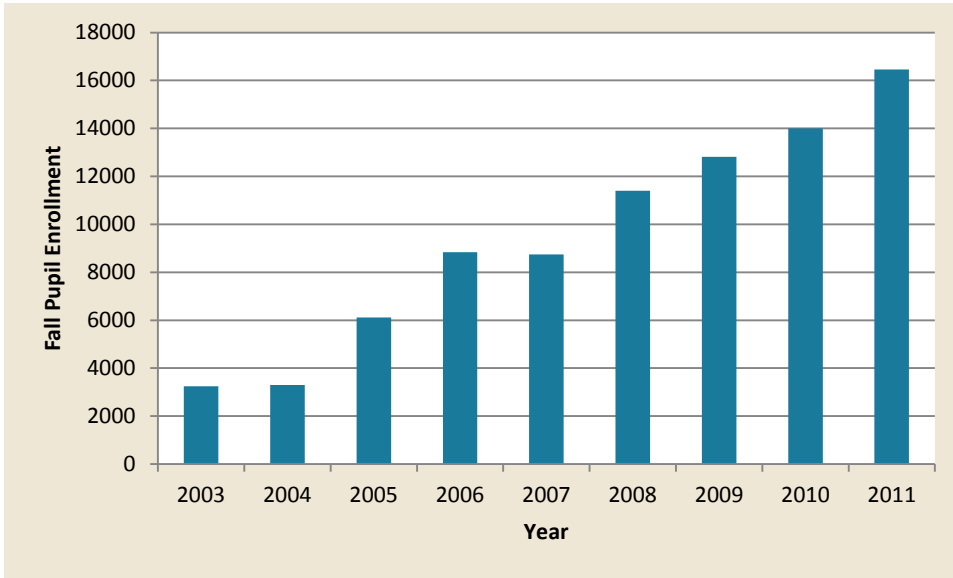
In addition to growth in enrollment, there have been significant changes in student demographics, economically disadvantaged status and grade level proportions over time. Students enrolled in online schools in 2003 consisted primarily of White students at 82%, with Hispanic students coming in a distant second at 14%, and the other minority categories making up the last 4%. This is notable when compared to the state-wide demographics in Colorado in 2003: 65% White, 25% Hispanic and 10% American Indian, Asian and Black. As time has passed, the proportion of racial/ethnic groups in online schools has changed and now more closely represents the state-wide distributions, though differences still remain. The percentage of white students in online schools has decreased by 21% and there has been an increase in both Hispanic (+13%) and Black (4%) students. While the overall percentage of black students has increased, in recent years the percentages have declined since the peak in 2007. The percentage of American Indian and Asian students in online schools has remained low throughout the years. Table 1 shows the percentage of students in each racial/ethnic group in online schools from 2003 through 2011, while Table 2 contains data from pupil enrollment across the state of Colorado.

Table 1: Demographics of Students in Colorado Online Schools from 2003 through 2011

Year	American Indian	Asian	Black	Hispanic	White	Pacific Islander*	2+ Races*
2003	1%	0.4%	2.6%	13.9%	82.1%	-	-
2004	1.1%	1%	2.9%	12.7%	82.3%	-	-
2005	1.2%	1.5%	11.6%	18.9%	66.8%	-	-
2006	0.9%	1.6%	13.7%	23.1%	60.7%	-	-
2007	1.5%	1.6%	11.3%	20.4%	65.2%	-	-
2008	1.4%	1.7%	8.5%	22.8%	65.7%	-	-
2009	1.7%	1.8%	8.7%	22.1%	65.6%	-	-
2010	1.6%	1.5%	7.4%	26.9%	61.2%	0.2%	1.2%
2011	1.4%	1.5%	7%	26.6%	61.3%	0.4%	1.7%

*The "Pacific Islander" and "2+ Races" designations were added in the 2010-11 school year.

Table 2: Demographics of Students in All Colorado Public Schools from 2003 through 2011

Year	American Indian	Asian	Black	Hispanic	White	Pacific Islander*	2+ Races*
2003	1.2%	3.1%	5.8%	25.3%	64.5%	-	-
2004	1.2%	3.2%	5.9%	26.2%	63.5%	-	-
2005	1.2%	3.3%	6.0%	27.1%	62.5%	-	-
2006	1.2%	3.7%	5.9%	28.6%	60.6%	-	-
2007	1.2%	3.4%	6.0%	27.9%	61.5%	-	-
2008	1.2%	3.6%	6.0%	28.4%	60.9%	-	-
2009	1.2%	3.7%	5.9%	28.6%	60.6%	-	-
2010	0.9%	2.9%	4.8%	31.6%	56.8%	0.2%	2.8%
2011	0.8%	3.1%	4.8%	31.9%	56.1%	0.2%	3.1%

*The "Pacific Islander" and "2+ Races" designations were added in the 2010-11 school year.

Another marked change in the make-up students in online schools has been the increase of students who are eligible for Free and Reduced Price Lunch (FRL). In 2003, only 7% of online students were eligible, while 31% of students were eligible across the State. From 2003 to 2006, there was a dramatic increase in the proportion of Free and Reduced Lunch eligible students enrolling in online schools. In 2011 the online school percentage of economically disadvantaged students was very close to State eligibility rates. Chart 2 shows the Free and Reduced Lunch eligibility trends both State-wide and in online schools.

Chart 2: Percentage of Students Eligible for Free and Reduced Lunch in the Fall Pupil Count for Online Schools and the State of Colorado
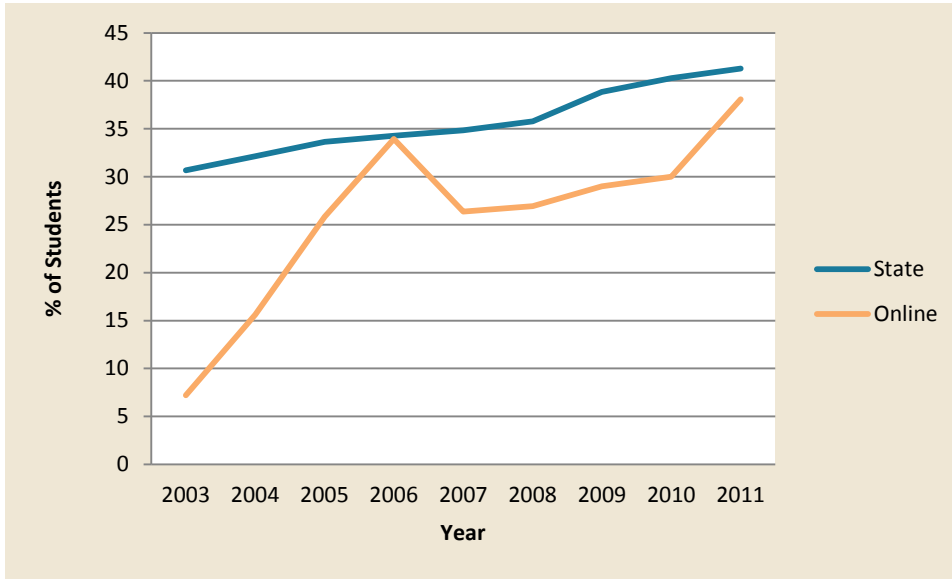

As student demographics and socioeconomic status in online schools have changed, so have the number of pupil enrollments and the proportion of grade levels served. In 2003, there were 3,248 students enrolled in online schools, with the largest percentage (50%) being elementary school students. Of the 16,464 students enrolled in online schools in 2011, high school students comprise the largest grade level group at 52%. Chart 3 shows the percentage of students enrolled at the different grade levels in 2003 and 2011.

Chart 3: Percentage of Online Students at Each Grade Level – Elementary (K-5), Middle (6-8) and High (9-12)
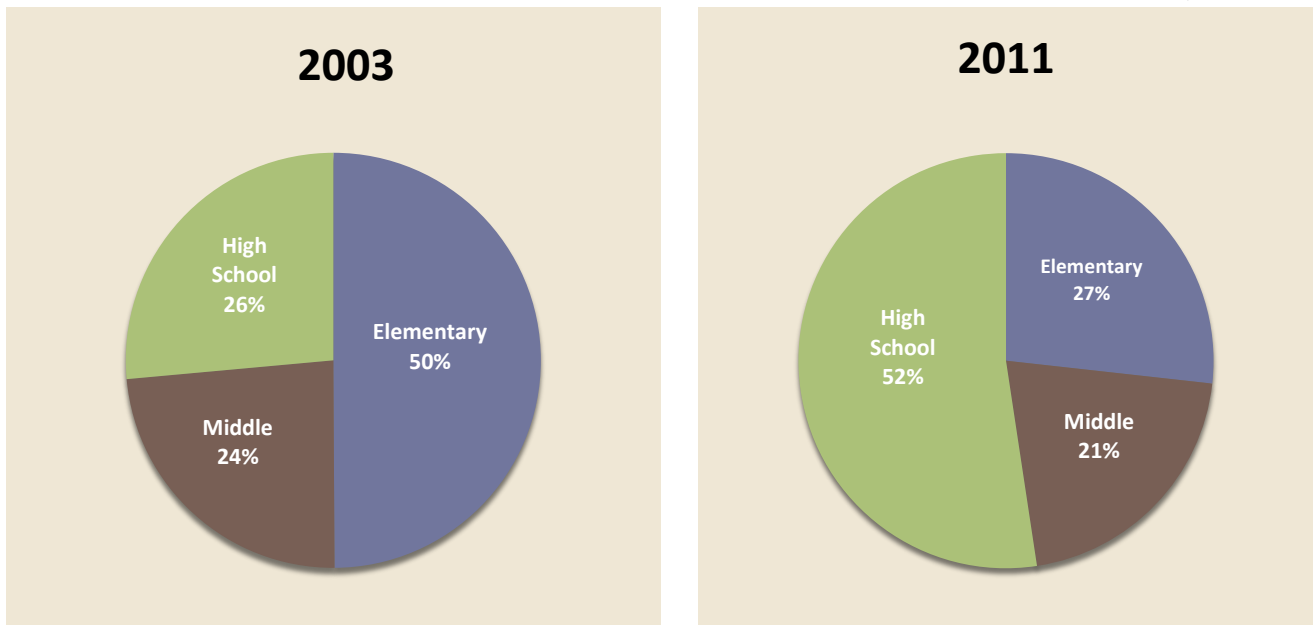
Another notable trend is the growth seen at the high school level, which has far out-paced the growth seen in both the elementary and middle school grade levels. At the elementary and middle school levels, the percentage of growth from 2003 to 2011 was 172% and 347% respectively, while the growth at the high school level during the same time period was 904%. Chart 4 shows the pupil membership for online schools at each grade level from 2003 through 2011.

Chart 4: Pupil Membership in Online Schools from 2003 to 2011 by Grade Level – Elementary (K-5), Middle (6-8) and High (9-12)
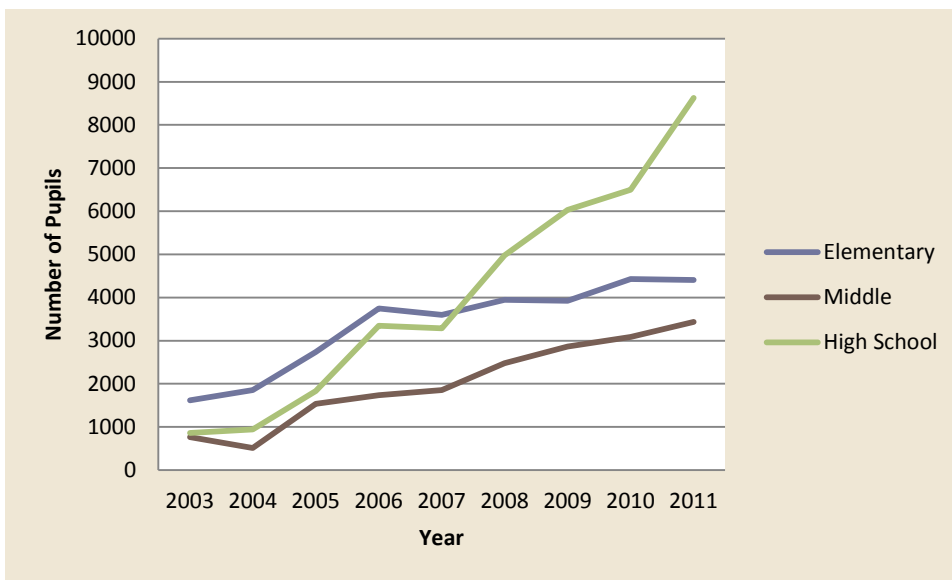

The graduation rate of online schools as a whole has consistently lagged behind the statewide graduation rate, but has followed a similar pattern in decline as the graduation rate Statewide. Additionally, the dropout rate seen in online schools as a group has been higher and more erratic than the statewide dropout rate throughout this same time span. Chart 5 shows the state graduation rates and the online school graduation rates from 2003-04 through 2010-11. Chart 6 shows the state dropout rates and the online dropout rates from 2003-04 through 2010-11.

Chart 5: Graduation Rates of Online Schools Compared to Statewide Graduation Rates from 2003-2011
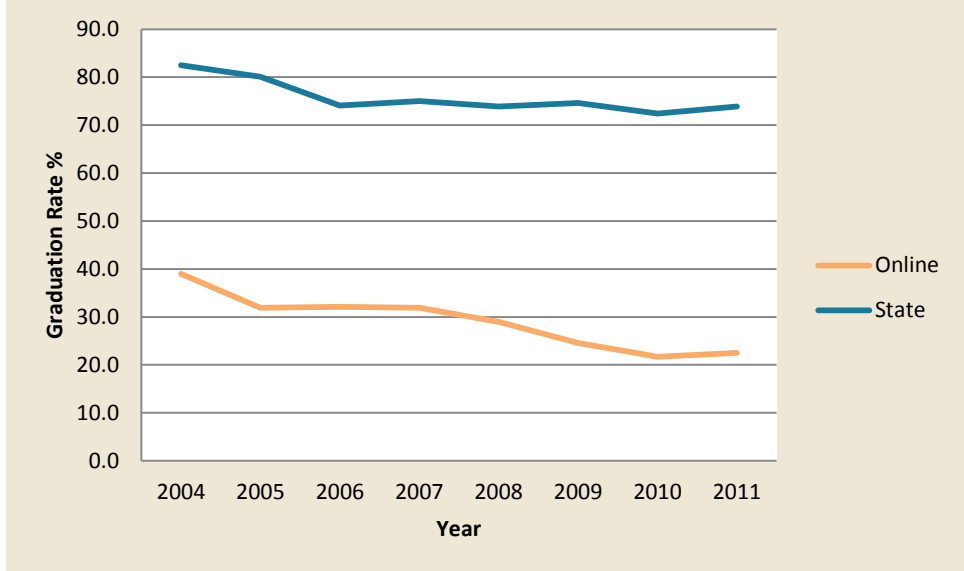

Chart 6: Dropout Rates of Online Schools Compared to Statewide Dropout Rates from 2003-2011
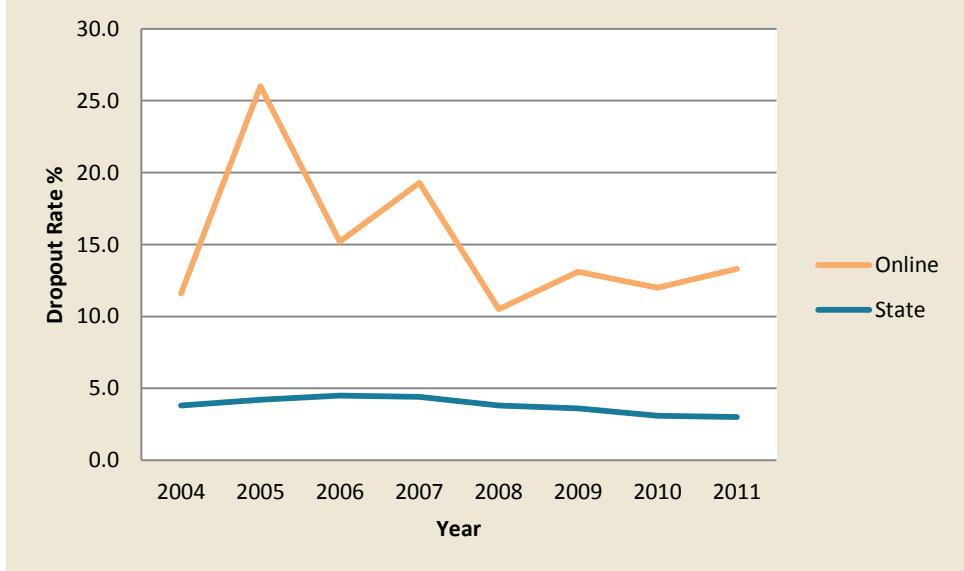
One more interesting statistic in which online schools differ greatly from schools statewide is the mobility incidence rate. The Colorado Department of Education has calculated mobility rates for schools, districts and the State since the 2006-07 school year. The mobility incidence rate is based on the number of atypical student entries and exits over the course of a school year. There are numerous non-normal entries and exits which are counted as mobility incidents, including transfer to or from another district, homeschool or private school.[v]

Typically online schools have much higher mobility incidence rates than the State, which indicates that individual students in online schools may be much more transient than their brick-and-mortar counterparts. This has been a subject of interest as the current funding model in Colorado is reliant on a single count window and high mobility in schools has been linked with poor academic performance. Chart 7 shows the mobility incidence rate for the State and online schools from 2006-07 through 2010-11.

Chart 7: Mobility Incidence Rates for the State and All Online Schools from 2006-07 through 2010-11
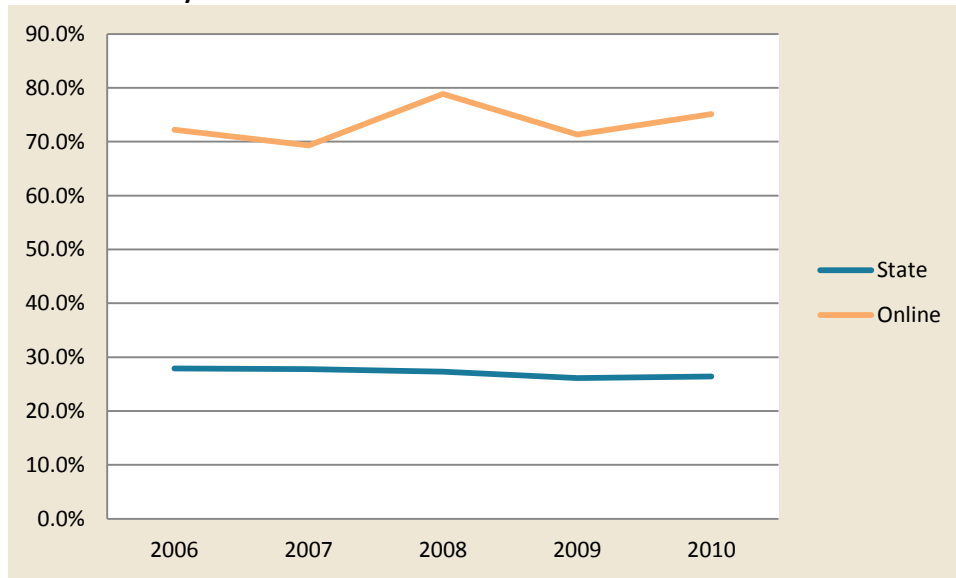
It is clear from the data shown that online learning has rapidly expanded and the characteristics of students have changed immensely over the past 8 years. What began as a small, marginalized education option for white, non-socioeconomic disadvantaged elementary school students has grown into a mainstream option with pupil demographics and socioeconomic levels that are fairly representative of those found statewide, along with a very large secondary-level population. As we explore the characteristics of students found in online schools, it makes sense to look at the different age groups as each group has different needs and is assessed by different measures. This study has divided online students into three main categories: 1) Students enrolled in Kindergarten through 3rd grade, 2) Students enrolled in 3rd through 9th grade and 3) students in 7th through 12th grade who were either graduates or dropouts. By examining characteristics of students from the time they enter the public education system through the time they exit, we get a better idea of which time periods are crucial and which factors are

indicators of risk or success. We also see how these factors may vary when students are enrolled in online schools and whether these schools enroll more students with certain characteristics. By identifying which student characteristics indicate success, in an online school or otherwise, we can provide guidance to help parents, students and schools make thoughtful choices about education at every grade level.

The Early Years – Kindergarten through Grade 3

A growing number of students in the early grades choose to enroll in online schools each year. This portion of the online study focuses on these children. We know that these years are critical to a child's education as they learn to read, read to learn, learn early mathematics and learn to write. Two cohorts of kindergarten students were the focus of this study. Cohort I were the students who entered kindergarten through 3rd grade in 2008. The students in Cohort 2 entered kindergarten in 2009. Cohort 2 was limited to kindergarteners to avoid the potential of the identification of some Cohort 1 students as a part of Cohort 2. The Cohort 2 kindergarteners were followed through the third grade in 2012. Kindergarten students in both cohorts were also analyzed in terms of their mobility.

The assessments that were included in the analyses for both cohorts included early achievement tests administered as a part of the Colorado Basic Literacy Act and subsequently the Colorado Student Assessment Program (CSAP) test that is administered to all students in grades 3 through 10. The State Board of Education revised the CBLA rules and assessments in 2007 to limit the CBLA assessments to three assessments: The Developmental Reading Assessment version 2 (DRA2), the Dynamic Indicators of Early Literacy (DIBELS), and Phonological Awareness Literacy Screening (PALS). Because of the 2007 revisions to the CBLA rules, the CBLA individual assessment data has only been available at the state level since 2008. Consequently, the earliest available kindergarten CBLA data for analysis is the 2008 data. The 2008 kindergarten cohort took the 3rd grade state reading assessment in 2011. The 2009 kindergarten cohort took the 3rd grade state reading assessment in 2012.

Cohort 1

In the fall of 2007, of the 65,635 students who entered kindergarten in Colorado, 362 students entered kindergarten in online schools. In addition, 442 students entered first grade, 404 students entered second grade and 384 students entered third grade in online schools. Table 3 provides the count for all K-3 students who were in online schools and brick and mortar schools in the 2007-2008 school year.

Table 3: Numbers of Students Entering Primary Grades in Online and Non-online Schools 2007-2008

Grade 2008	ONLINE08		
	Online	Not Online	Total
	Count	Count	Count
Kindergarten	362	65,273	65,635
Grade 1	442	66,948	67,390
Grade 2	404	65,732	66,136
Grade 3	384	63,826	64,210
Total	1592	261,779	263,371

Table 4 provides the breakdown of students into 15 different patterns of online enrollment during the four-year period from 2007-2008 to 2010-2011. There were students who were enrolled in online schools for all four years, those who enrolled in online schools three of the four years, two of the four years or one year during the four-year period. Clearly, online education was seen as an option at some point for 4,659 of the students enrolled in grades K-3 in Cohort 1. Of the 4,659 online students in grades K-3 a total of 520 (11%) were enrolled in an online school during the entire four year period. Of the 362 students originally enrolled in an online school during kindergarten, 95 (26%) remained in an online school for all four school years.

Table 4: Numbers of Students Entering Primary Grades 2007-2008 – Cohort 1

		Grade 2007-2008				
		Kindergarten	Grade 1	Grade 2	Grade 3	Total
Online Status	**Duration of Online Enrollment**	Count	Count	Count	Count	Count
Online Student at Some Point 2007-08 to 2010-11	Online 2008, 2009, 2010 , 2011	95	144	144	137	520
	Online 2008,2009, 2010	57	77	67	64	265
	Online 2009, 2010, 2011	5	19	25	25	74
	Online 2008, 2009	90	133	116	120	459
	Online 2008, 2011	6	4	2	2	14
	Online 2009 ,2010	21	21	23	26	91
	online 2009, 2011	5	10	10	10	35
	Online 2010, 2011	91	138	141	114	484
	Online 2008, 2009, 2011	16	21	30	21	88
	online 2008, 2010, 2011	0	3	3	2	8
	online 2008, 2011	2	5	3	2	12
	Online 2008 only	42	62	55	67	226
	Online 2009 only	62	97	92	83	334
	Online 2010 only	127	179	200	200	706
	Online 2011 only	250	393	362	338	1343
	Total Online Students	869	1306	1273	1211	4659
Never an Online Student 07-08 to 2010-11	Never in an Online School	64766	66082	64863	63000	258711
	Total	64766	66082	64863	63000	258711

Cohort 2

In the fall of 2008, 659 students entered kindergarten in online schools. Following the 2008-2009 class until the 2011-2012 school year, another 789 kindergarten students entered an online school at some point during the four school-year period. That means that by 2010-2011, a total of 1,448 students from the 2008-2009 kindergarten students in Cohort 2 entered an online school for at least one year during the period from fall 2008 to the spring of 2012. Of the 659 Cohort 2 students originally enrolled in kindergarten in an online school, 139 (21%) remained in an online school for all four school years. The students not enrolled in online schools were less mobile with about 45 percent remaining the same school over the same four-year period.

Table 5 provides the breakdown of 2009 Cohort 2 kindergarten students into 15 different patterns of online enrollment during the four-year period from 2007-2008 to 2010-2011. Again, there were students who were enrolled in online schools for all four years, those who enrolled in online schools three of the four years, two of the four years or one year during the four-year period. Clearly, online education was seen as an option at some point for 5,765 of the students enrolled in grades K-3 in Cohort 2. Of the 1,448 online students, less than 10% (139) were enrolled in an online school during the entire four year period.

**Table 5: Numbers of Students Entering Kindergarten 2008-2009**

Online Status	Duration of Online Enrollment	2009 Kindergarten
Online Student at Some Point 2008-09 to 2011-12	Online 09, 10,11,12	139
	Online 09, 10, 11	88
	Online 09, 11, 12	15
	Online 09, 10, 12	8
	Online10, 11,12	75
	Online 09, 10	212
	Online 09,12	4
	online 10, 11	38
	Online 11, 12	136
	Online 10, 12	8
	Online 09, 11	8
	Online 09 only	185
	Online 10 Only	178
	Online 11 Only	169
	Online 12 Only	185
	Total Online Students	1448
Not Online	Never Online	67140
Total Students		68588

Achievement Results: Colorado Basic Literacy Act (CBLA) and Colorado Student Achievement Program (CSAP)

The Colorado State Board of Education has approved three assessments to be used for the Colorado Basic Literacy Act. The tests are Developmental Reading Assessment, Second Edition (DRA2), Dynamic Indicators of Basic Early Literacy Strategies 6th Edition (Dibels) and the Phonological Awareness Literacy Screening (PALS). Districts can choose one of the three tests to administer. Sometimes the district allows schools to make the choice of which test to administer. In 2008, nearly half (49%) of the students across Colorado were assessed with the Dibels, 42 percent were assessed with the DRA2 and the remaining 9 percent were assessed with the PALS. In addition to the assessments, decisions about student CBLA classification are based on a body of evidence gathered about the child by teachers during the year.

Typically, 80-90 percent of students classified as 'at grade level' on the CBLA assessments score proficient or advanced on the reading test of the CSAP when they are in third grade[vi]. So, 10-20 percent of these students are inaccurately classified as on grade level given the CSAP results. This margin of error is higher in online schools based on the findings from this study. In 2008, 70 percent of online students that had been classified on the CBLA in K-3 as being 'at grade level' subsequently scored proficient on the CSAP. This means that online schools in these years were classifying 10-20 percent more students on grade level that were later not on grade level than the average school. The results in Chart 8 show that K-3 students classified as 'at grade level' on the CBLA assessments in brick and mortar schools achieved a higher degree of proficiency on the grade 3 reading assessment than did the K-3 students classified 'at grade level' on CBLA assessments in online schools. This indicates that there is a higher degree of error in online schools for K-3 students 'at grade level' in either year.

Chart 8: CBLA Grade Level Classification Grade K-3 Students and the Percent Proficient/Advanced on Grade 3 Reading Assessment in 2011
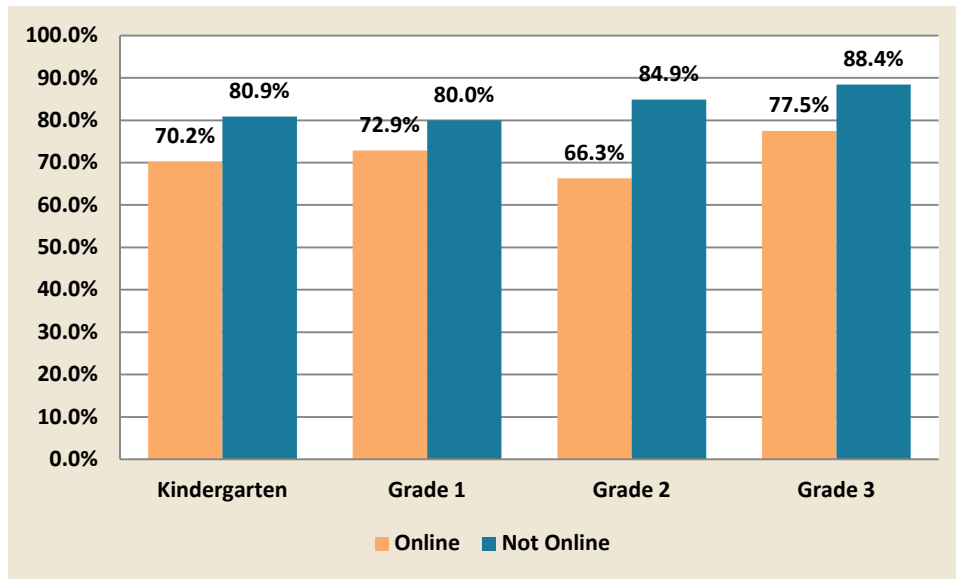
CSAP reading and math results in grades 3-6 in 2011 for students who were in kindergarten in 2007-08 are presented in Chart 9 and Chart 10. As with the findings from the 3rd grade scores presented above, the percentage of online students attaining proficiency or above in either content area across all of these grades are below those for the students who did not attend an online school.

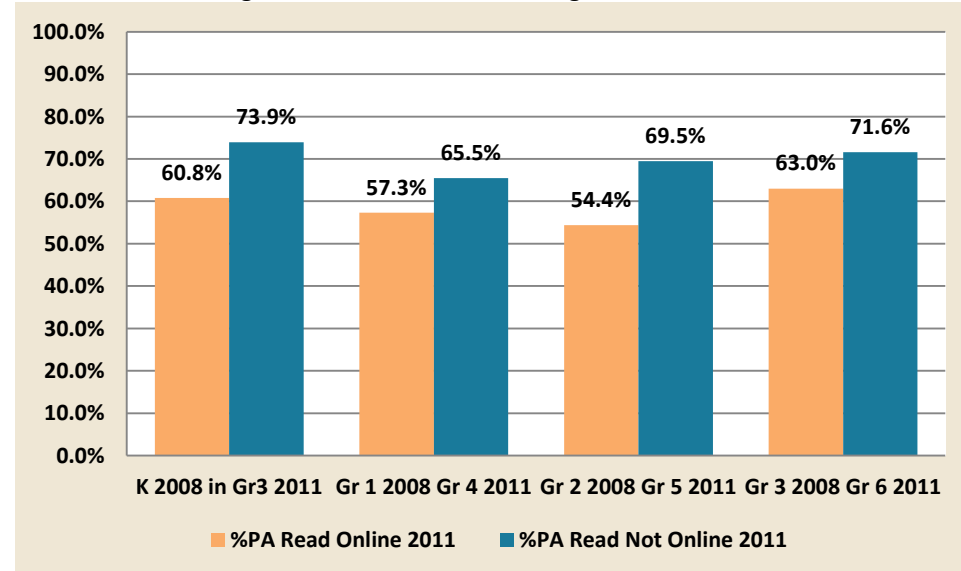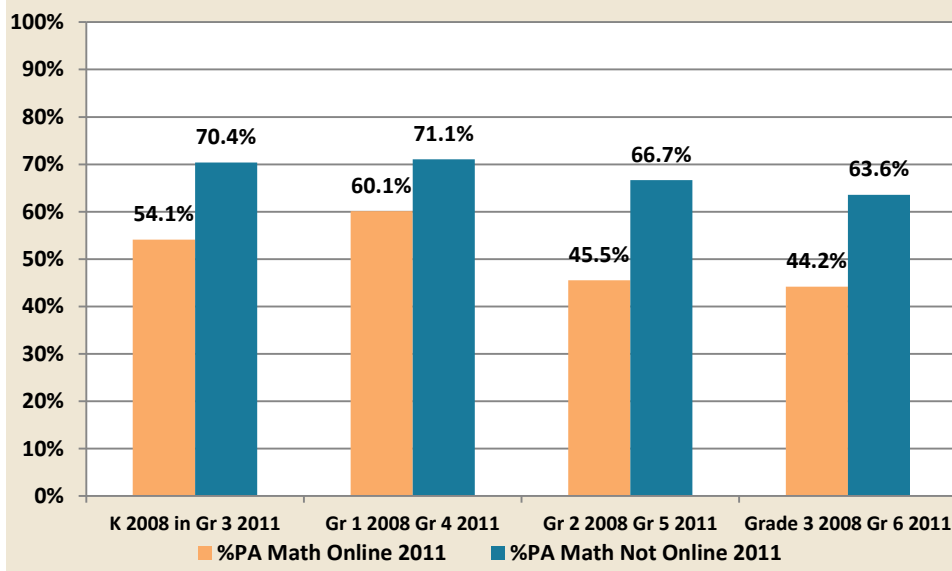**Chart 9: CSAP Reading Results for Cohort of 3rd-6th grade students in 2011 that were in Grades K-3 in 2008 2011**

Chart 10: CSAP Math Results for Cohort of 4th-6th grade students in 2011 that were in Grades K-3 in 2008

The Primary & Formative Years - Grades 3 through 9

Prior to beginning this study, online school leaders indicated that the students who were enrolling in their 9th grade classes were coming in considerably below grade-level. As such, one of the areas that this section examines is the academic history and effect of past academic performance on proficiency upon entry into high school.   The second trend that had been shared from the field was that students enrolling in online schools tended to have higher mobility than the typical student (both before and after enrolling in the online school). CDE mobility data shows that at the school level, online schools have some of the highest mobility rates in the state of Colorado[vii].

The question that was raised by the field, given this research and the schools' experiences, was: how many schools had their students been previously enrolled in before enrolling in the 9th grade in their online schools and what were the effects of these highly mobile students on their academic performance?

In order to determine whether and how past academic performance affects the performance of 9th grade students, the past academic performance and individual mobility of two representative samples of 9th graders who took the CSAP in 2009 and 2011 were explored. The findings from these general analyses were then applied to 9th grade students enrolled in online schools in both 2009 and 2011 to determine whether students enrolled in online high schools had a different academic performance and mobility history than students in the state-wide samples.

Importance of Early Learning on Student Outcomes through Middle School and into 9th Grade

As discussed in the previous section on the Early Years, the academic knowledge and skills students obtain in grades kindergarten through 3rd grade are important, but the magnitude of this importance over time can be staggering. This section looks more closely at the impact of early learning on latter achievement.

The analysis that was done started with an examination of trends across all schools (both online and brick-and-mortar). The proficiency of all 9th graders included in the 2009 and 2011 CSAP collections were examined in reading from 3rd grade all the way through 9th grade. Of the 2009 and 2011 students who were not proficient in reading as 3rd graders, 70% remained non-proficient as 9th graders. Furthermore, the percentage of students who remain non-proficient at each subsequent level increases steadily over time, indicating that it becomes more and more difficult for students to catch up over the years. Table 1 shows that failure to meet students reading needs in the 3rd grade can have significant negative effects on student proficiency through high school. Students who continually remain behind enter high school at a marked disadvantage. This impacts the students' ultimate opportunities in life and makes it significantly more challenging for the schools they attend to catch them up in time for graduation. Table 6 and 7 show the number and percentage of students who remained not proficient in CSAP Reading when they tested as 9th graders based on their proficiency at each grade level.

Table 6: Percentage of <u>All</u> 9th Graders in 2009 Proficient on CSAP Reading based on Proficiency at Primary and Middle Grade Levels (Total N of 9th Graders =60,170)

Grade	3rd	4th	5th	6th	7th	8th
Not Proficient in Grade-N	11756	17149	15388	15655	18128	17628
Still Not Proficient in 9th Grade-N	8187	11149	11003	11744	13222	13361
% of Students Not Proficient who Remain Not Proficient through 9th Grade	69.6%	65.0%	71.5%	75.0%	72.9%	75.8%

Table 7: Percentage of All Incoming 9th Graders in 2011 Proficient on CSAP Reading based on Proficiency at Primary and Middle Grade Levels (Total N of 9th Graders =59,824)

Grade	3rd	4th	5th	6th	7th	8th
Not Proficient in these Grades	12567	15413	15479	14693	17239	16928
Still Not Proficient in 9th Grade	8766	11187	11749	11607	13398	13712
% of Students Not Proficient in Earlier Grade who Remain Not Proficient through 9th Grade	69.8%	72.6%	75.9%	79.0%	77.7%	81.0%

Proficiency in Online 9th Graders

As demonstrated in the previous sections, it is apparent that students' academic performance at early ages can be a strong indicator of future academic performance, as students who fall behind early have a difficult time catching up in any educational setting. This section of the study will look specifically at 9th grade students in online schools to see how those students are entering and performing in online schools as compared to the students as a whole discussed in the previous section. While students entering the 9th grade academically behind is not an issue unique to online schools, a question this research explores is whether online schools receive a disproportionately higher number of 9th graders who are academically deficient.

Based on the findings presented earlier that <u>all</u> students who were behind tended to stay behind, 9th graders in online schools in 2009 and 2011 were evaluated to determine if there was a large percentage of students who were behind before their 9th grade year. A total of 1279 9th graders took the CSAP in an online school in 2009 and 1208 9th graders took the CSAP in an online school in 2011. These ninth graders were divided into two different groups: students who were enrolled in an online school for the first time and students who had been enrolled continuously in an online school for at least 4 years (including 9th grade). The proficiency rates for these groups as 8th and 9th graders were compared with the percent proficient for all 8th and 9th graders statewide who had

taken the CSAP in 2009 and 2011[1]. Table 8 shows the rates of proficiency for online as compared to all students in 8th and 9th grade by group of students.

Table 8: Percentage of 2009 and 2011 9th Graders Proficient in CSAP Reading as 8th and 9th Graders

	2009			2011		
	Number of Students	% Proficient in 8th Grade	% Proficient in 9th Grade	Number of Students	% Proficient in 8th Grade	% Proficient in 9th Grade
1st Time in an Online School	855	30.6%	46.8%	640	44.4%	50.6%
4+ Years Continuously in an Online School	91	60.4%	62.6%	109	Not Available[1]	73.4%
All 9th Graders in Online Schools	1279	34.3%	48.2%	1208	Not Available[1]	52.6%
All 9th Graders Statewide	60170	60.9%	67.0%	59824	62.6%	65.6%

As seen in Table 8, differences exist in the rates of proficiency, not only in a comparison between all online students and students statewide, but between each group of students who took the CSAP in an online school. Overall, 9th graders statewide performed better than their online counterparts as a whole. Given the proficiency levels, many of these students who entered online schools for the first time as 8th and 9th graders were likely to be much farther behind academically prior to enrolling in an online school than the statewide average. What is more, these students made up the majority of online 9th graders, both in 2009 and 2011. Almost 70% of online 9th graders in 2009 were new to any online school, while over 50% of online 9th graders in 2011 were new to an online school.

On the other end of the spectrum, 2011 9th graders who were enrolled continuously in an online school for four years or more outperformed every other subgroup, including 9th graders statewide. This group had a 9th grade proficiency rate of 73.4%. Unfortunately this group of students is very small, with only 109 students remaining in any of the online schools continuously for four years or more. Fortunately, this group provides some insight related to another factor that is suspected to affect students' academic performance: mobility.

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[1] 2010 CSAP data was not used due to a testing misadministration by one of the largest online schools in Colorado.

Effect of Mobility on Student Outcomes upon High School Matriculation

Student mobility emerged as a potential problem in online schools after media attention on the issue surfaced in the Fall of 2011. Given this attention and questions that this media attention raised, it was important for CDE to do some analysis on this topic for this study. First, an analysis of the number of schools students attended was used to measure student mobility. Prior to focusing on online, the researchers first examined a random sample of all 9th graders (online and non-online). As shown in Chart 8, in 2009, half of the 9th graders in this sample (49.9%) had been enrolled in 3 schools from 3rd through 9th grade. In 2011, just over half of 9th graders in the sample (52.3%) had been enrolled in 4 schools from 3rd grade through 9th grade (It is unclear why this change occurred, but could be the subject of future research).

Based on this data, one could argue that by 9th grade, most students will have been enrolled in three to four schools from 3rd grade through 9th grade. This is logical, as most Colorado districts have separate elementary, middle and high schools. There are a number of reasons why students may have attended fewer than three schools, including the existence of K-8 schools, students previously in home school or private school and students who have transferred from another state or country. The percentage of 9th graders enrolled in five or more schools increased from 12% in 2009 to 28.9% in 2011, indicating an increase in individual student movement between schools. Again, it is unclear why this occurred, but it is an interesting trend to note. The percentage of 9th graders from the cohorts enrolled in a given number of schools during this time period is shown below in Chart 8.

**Chart 8: Percentage of Total Students by the Number of Schools Attended (online and non-online)**
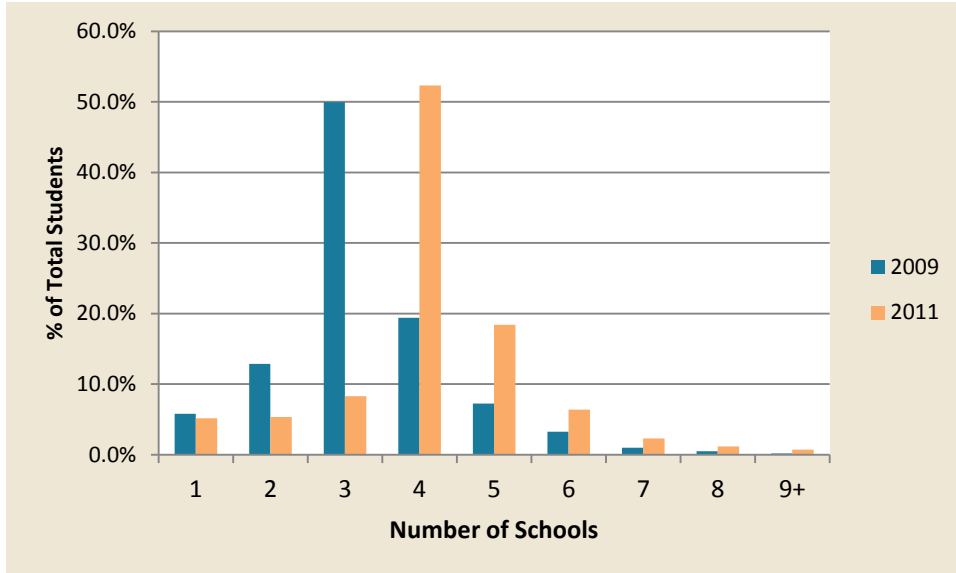
A second area of analysis relative to mobility was to examine the relationship between academic achievement and mobility, the theory being that lower performance correlates with higher mobility. Again, before looking exclusively at online, the researchers first examined this relationship for a cohort of 9th grade students (non-online and online combined). The percentage of cohort students in 2009 and 2011 who were proficient and had attended a specific number of schools was calculated. As evidenced in Chart 9, among the cohort of students who were 9th graders in 2009, there was a decline in the percentage of students who were proficient as the number of schools attended increased (excepting students who have only attended one Colorado public school). The percentage of students who had attended two schools and were proficient was 75.8%, but as the number of schools increased the percentage of proficient students decreased, resulting in those who had attended eight schools at 21.4% proficient.

Chart 9: 2009 9th Grade Sample-Percentage of Students Proficient on the CSAP Reading Assessment by Number of Schools Attended
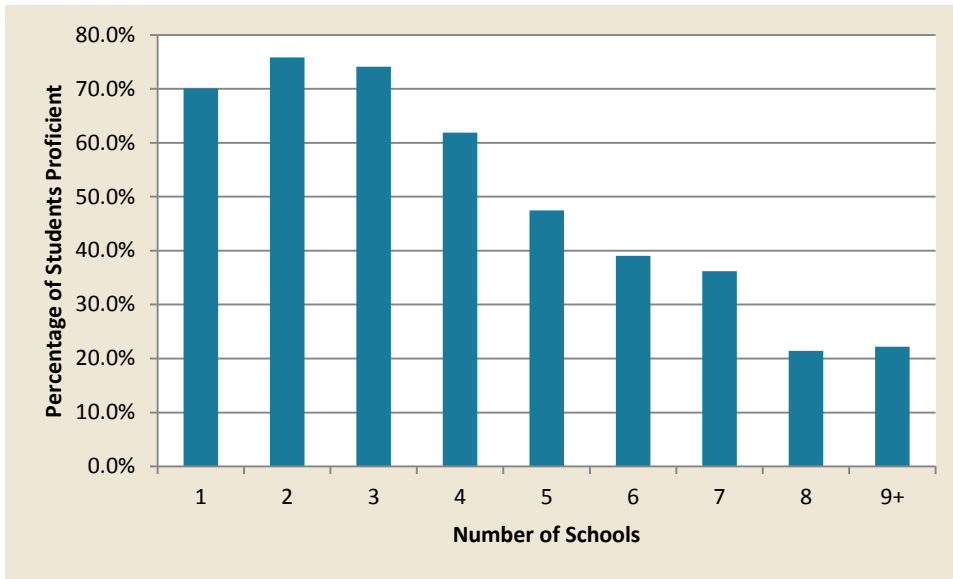
Although there was a very strong declining trend in the percentage of proficiency in the 2009 9th graders, as the number of schools attended increased (as shared in Chart 9), the results were different for the next cohort. An examination of the results for the 2011 9th graders in Chart 10, show that the percentage of proficiency actually increased up to four schools attended and then steadily declined as students attended five or more schools.

Chart 10: 2011 9th Grade Sample-Percentage of Students Proficient on the CSAP Reading Assessment by Number of Schools Attended
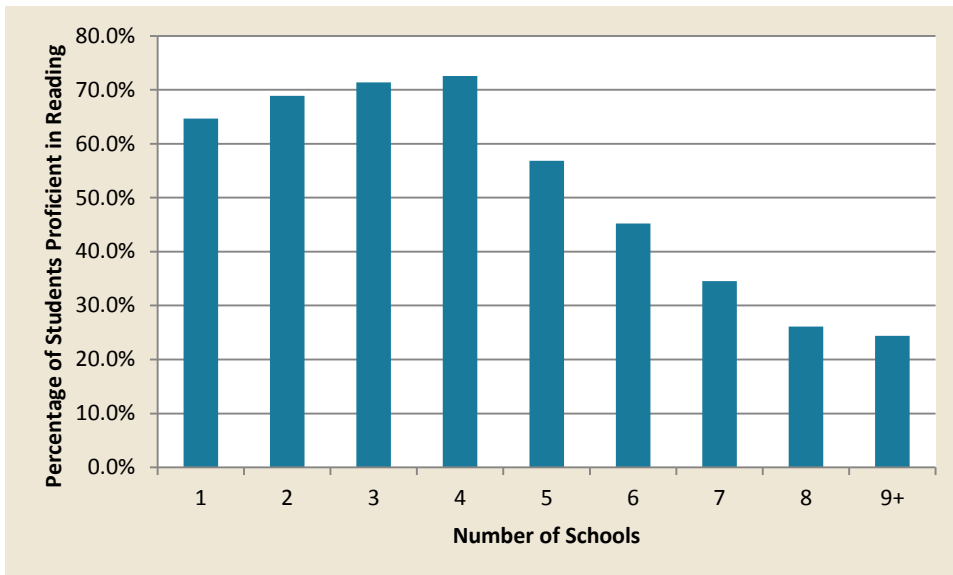
Individual Student Mobility of 9th Grade Students Enrolled in Online Schools

This section shares results about how 9th grade online students compared with the overall student population

information shared above regarding mobility and performance. As discussed previously, 9th grade students who

enrolled in an online school for the first time were the least proficient of all subgroups at 50.6% (Table 8). These

first-timers to online in 9th grade also had the most students who had been previously enrolled in six schools or

more, 22.3% (Table 9). This is double the percentage of students in the statewide sample who have been enrolled

in 6 schools or more, 10.6% (Table 9). Students who had been enrolled in online schools for 4+ years had the least

number of school transitions: half of these students attended only one or two schools (49.5%). Table 9 shows the

percentage of online students enrolled in a specific number of schools by subgroup.

Table 9: Percentage of 2011 9th Grade Online Students in each Subgroup by Number of Schools Attended

Student Group	1	2	3	4	5	6+
1st Time OL	11.6%	5.2%	15.9%	26.9%	17.9%	22.3%
4+ Years in OL	21.1%	28.4%	19.3%	25.7%	4.6%	0.9%
All OL	10.1%	10.6%	19.0%	26.2%	16.4%	17.5%
Statewide Sample	5.1%	5.3%	8.3%	52.3%	18.4%	10.6%

The proficiency rates of the 2011 9th grade online students by number of schools attended were also explored and

while proficiency rates declined as the number of schools increased, they did not decline as greatly as the

proficiency rates seen in students in the statewide sample. Students from the statewide sample who had been

enrolled in nine or more schools had a proficiency rate of 24.4%, while the online students had a rate of 33.3%.

Online students seemed to outperform their statewide counterparts once the number of schools reached seven.

The cause of this is unknown and could be the subject of future research.

Chart 11: Percentage of 2011 9th Graders Proficient in CSAP Reading by Number of Schools Attended
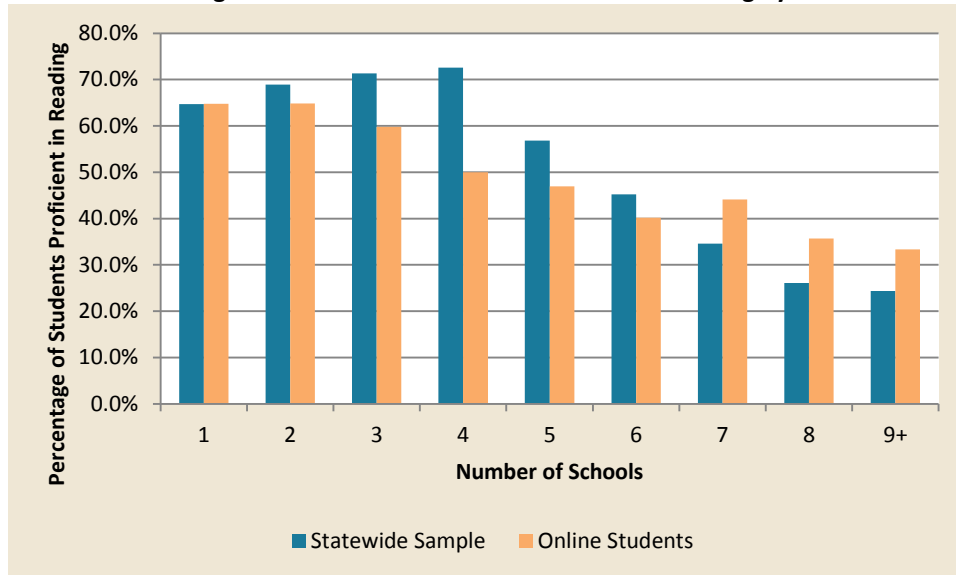
Based on overall proficiency in online schools versus the statewide sample, it was expected that online students would have a much higher percentage of students who had attended more than the expected three to four schools. While this is the case in some of the subgroups, the other interesting trend noted was that the number of schools attended by online students has a wider distribution and seems to vary far more than the statewide sample. This may indicate that online student enrollment patterns are much more diverse than brick-and-mortar enrollment patterns and may be due in part to the easy accessibility of multiple online schools versus the accessibility of a limited number of geographically proximate brick-and-mortar schools. Other factors may also exist and need to be explored.

Using these data as guidance, it is recommended that the number of schools that a student attends in the 3rd grade through 9th grade should be kept to a minimum as much as possible. Any unnecessary or atypical moves between schools should be avoided and schools that have enrolled students with an abnormally high number of schools attended should monitor those students closely. Schools and districts also need to ensure that they are not systematically forcing students to transfer or withdraw by adhering to policies and procedures that "push out" students. Such policies contribute to unnecessary and excessive student mobility, which as the data have shown is related to poor academic performance. Parents also share responsibility in limiting their child's school

transfers. Parents who opt to enroll their student in a choice option or are withdrawing their child from a school need to explore all possibilities to determine the best long-term educational solution for their child, as it seems that continuity is very important in the elementary and middle school years.

## Secondary Success – A Look at Dropouts and Graduates

If the academic performance of students on State assessments can be predicted using historical data of individual students, it would seem that the same type of analysis could also be used to identify variables that factor into the likelihood that a student will either graduate or drop out of school. Because reading proficiency and student mobility had such a strong relationship with academic performance, the same variables were evaluated to determine if there was a similar relationship between graduates and dropouts.

Every student coded as a dropout or graduate in the 2010-11 end-of-year collection were compared to students who dropped out or graduated from an online school in the same year. These student groups were used to compare the number of schools and most recent reading CSAP proficiency of students. The demographics, gender and socioeconomic status of these groups were also compared to all graduates and dropouts statewide to determine if there were any notable differences in students who graduated or dropped out from an online school versus characteristics seen in all graduates and dropouts across the State.

Students who graduate from online schools have similar demographics as students who graduated statewide. The majority of graduates were white, with Hispanic students making up the second largest percentage of graduates both statewide and in online schools. Chart 12 shows the race and ethnicity of online school graduates and all graduates statewide.

Chart 12: Race and Ethnicity of Online School Graduates and All Colorado Graduates in 2010-2011
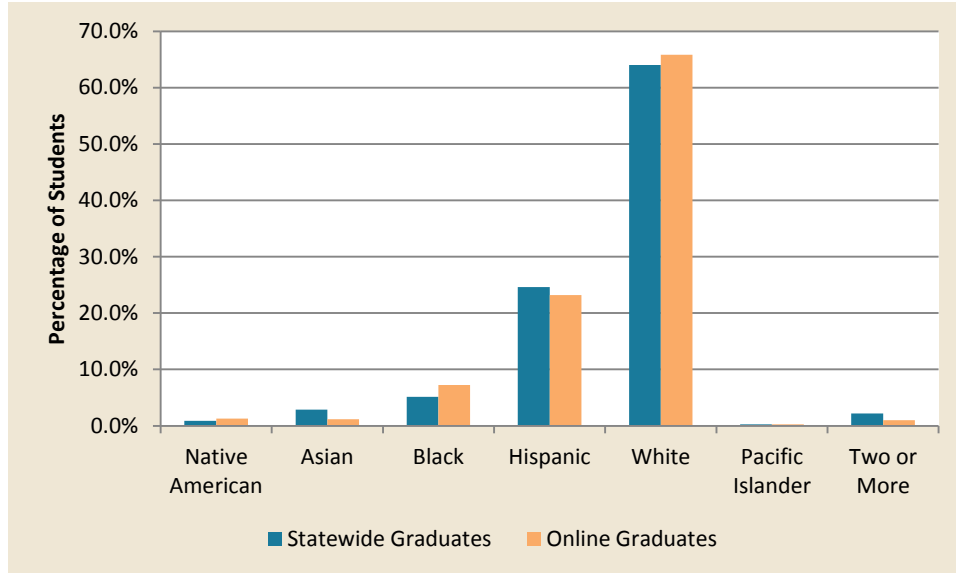

There were no notable differences in race and ethnicity with regard to graduates, there was a noticeable difference between the percentage of female students who graduate in online schools and the percentage of female graduates statewide. Of all Colorado graduates in 2010-11, female students comprised 50.6%, while in online schools female students accounted for 60.4% of graduates.

Although the demographics of online graduates and statewide graduates were fairly similar, there were some prominent differences in online dropouts compared to the statewide dropouts. While white students accounted for 37.9% of the dropouts statewide, in online schools, white students made up 64.9% of dropouts. Another interesting finding was that the percentage of Hispanic students who comprise online dropouts is much lower than the statewide percentage. Only 26.1% of online dropouts were Hispanic compared with 48.2% of the statewide dropouts. While the percentage of Hispanic students graduating from online schools was still lower than the statewide percentage, further study into this lower dropout percentage in online schools deserves further study.

Chart 12: Race and Ethnicity of Online School Dropouts and All Colorado Dropouts in 2010-2011
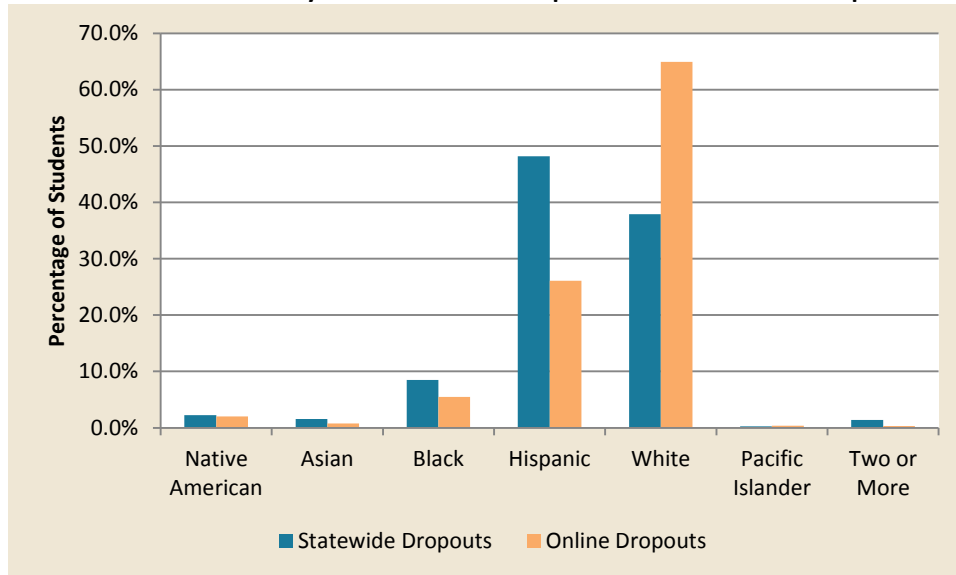
There were a few other noticeable differences between the online dropouts and dropouts in the statewide sample. A higher percentage of female students drop out of online schools than the percentage statewide in 2010-11. Female dropouts comprised 56% of online dropouts, whereas only 44.1% of statewide dropouts were female.

Additionally, online schools had a higher percentage of dropouts at lower grade levels than statewide dropouts. Students in grades 11 and 12 accounted for 67.5% of dropouts statewide, but in online schools 56.2% of dropouts were in 11th and 12th grade, and 10.8% were 7th and 8th graders while only 5.9% of statewide dropouts were in the 7th and 8th grades.

The number of schools graduates had attended within a four year period, including the year of graduation, was determined for online graduates and for graduates within the representative statewide sample. It was expected that most students would have attended one school as students generally attend a high school from 9th grade through 12th until graduation. The number of schools for graduates and dropouts was compared in the statewide sample from 2011. The vast majority of graduates (69.4%) attended only one school during this four year period compared to only 18.2% of dropouts attended one school. It would seem that individual student mobility may also affect the likelihood of a student graduating. Only a very small percentage of graduates have attended three

or more schools. Chart 13 shows the percentage of graduates and dropouts in the statewide sample by number of schools attended.

Chart 13: Percentage of Graduates and Dropouts by Number of Schools Attended from 2007-08 through 2010-11
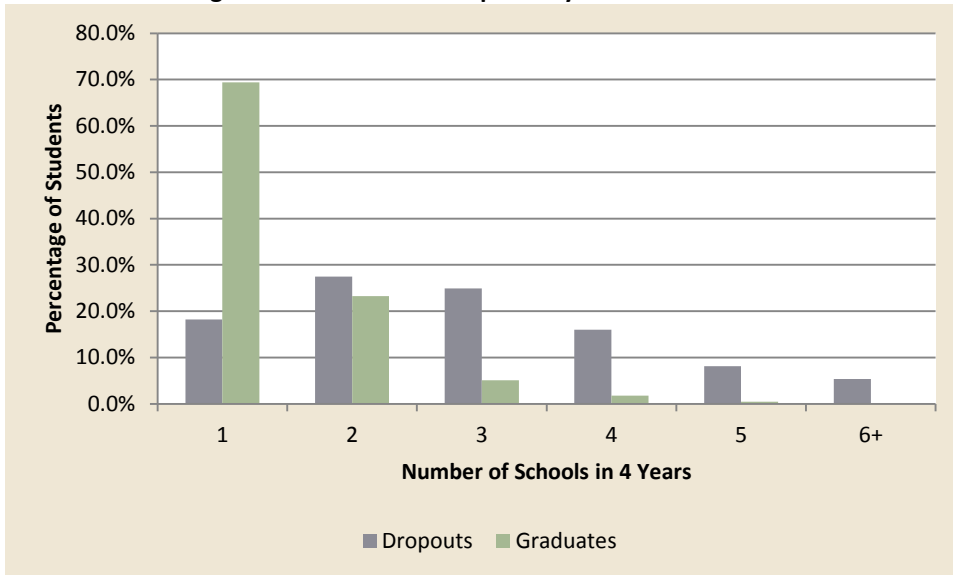
Of students in the statewide sample, 69.4% attended a single school for four years compared to only 13.2% of online graduates. Only 2.4% of students in the statewide sample had attended four or more schools, while 11.9% of online graduates had attended four or more schools. Online graduates on average attended more schools than their statewide counterparts. While graduates statewide attended an average of 1.41 schools in a four year period, online graduates attended an average 2.43. Another interesting discovery was that 44.2% of online graduates had just transferred into the online school from which they graduated from another Colorado district or school. On the other hand, only 6.3% of all graduates statewide had transferred into a new school that year prior to graduation. Chart 14 shows the percentage of students by the number of schools attended within a four year period.

Chart 14: Percentage of Online Graduates and Graduates Statewide by Number of Schools Attended from 2007-08 through 2010-11
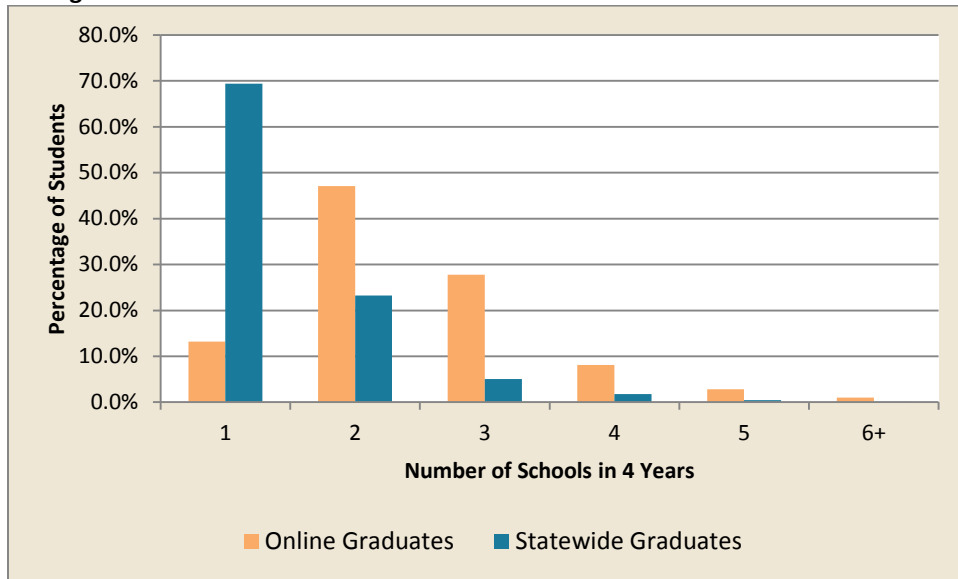
This study also examined whether reading proficiency on CSAP could be an indicator of secondary outcomes, much as early academic performance may be predictive of later academic performance. With this in mind, the most recent CSAP scores of graduates and dropouts in online schools were compared to all graduates and dropouts in 2010-11. Statewide graduates had the highest proficiency rate with 72.1%, followed by online graduates at 60.9%. Statewide dropouts had the lowest proficiency rate at 27.1% and the highest percentage of students who were not proficient on their most recent CSAP.

Table 10: Percentage of Students Proficient and Not Proficient on their Most Recent CSAP Assessment

Student Group	%Never Tested	%Not Proficient	%Proficient
Online Dropouts	7.8%	50.5%	41.7%
Online Graduates	9.8%	29.3%	60.9%
Statewide Dropouts	9.4%	63.6%	27.1%
Statewide Graduates	4.9%	22.9%	72.1%

Recommendations

1. Early and accurate identification of struggling students coupled with swift and targeted interventions is critical in the early years (K-3). Given poor performance of online students in the early years, leading to lower performance throughout their academic career, online schools need to identify more accurate measures of assessing students and utilize more effective interventions in the earliest grades in order to put their students on a track to be successful over time.

2. Due to the negative impact on student performance and success associated with attending numerous schools, parents should find the best school options for their children and keep them there for as long as possible to avoid enrolling their children in multiple schools outside of typical matriculation (e.g. elementary to middle school to high school). Similarly, schools and districts should consider a student's history, including the number of schools they have attended, before recommending expulsion or transfers. If an atypical school change is necessary, a long-term educational setting (online or otherwise) that is a good fit for the student needs to be identified. With this discovery, there are a few additional recommendations that can be made:

    a. Schools and districts should evaluate policies and procedures that may in effect "push out" students and result in sometimes unnecessary changes in academic setting. Instead, it is preferable that schools identify struggling and/or at-risk students through a Response to Intervention process and attempt to retain students with the purpose of promoting a consistent educational setting.

    b. It is imperative that schools and districts establish an orientation and assessment process for students who are new to the school and/or district. It should not be assumed that a student is at grade-level based on transcripts or grades from another educational setting. Establishing an "intake" process is especially important for struggling students and students who have already been through multiple educational settings. If a student does enroll in a school and

that student has already been enrolled in more educational settings than would be expected for his/her grade level, it could be an indication that the student may require additional academic support.

    c.   Choosing any educational setting, including an online school, as a short-term solution is risky to young students' academic performance, especially students who are already behind academically. If a student is struggling with an affective issue such as an illness or bullying and he/she is proficient, then enrollment in an online school short-term may be an acceptable option. It is not recommended that students enroll in an online school short-term in order to "catch up" academically.

3. The State should consider developing an "Early Warning System" that flags students who demonstrate characteristics which may result in low academic performance or a higher risk of dropping out. This data could then be shared with students' districts and schools so they may take appropriate action. Based on the data from this study, individual student mobility and poor performance in the early grades could be measures used to identify such students.

4. With the high percentage of students transferring to online schools, either just prior to dropping out or graduating it does appear that online schools may be used as a last resort for many students. Tied to the fact that while only 1.8% of 12th graders statewide who are proficient end up dropping out, nearly 13.9% of 12th graders in online schools who are proficient end up dropping out, it is very clear that there are more complex variables that factor into dropouts in online schools. Online schools that enroll a high number of transfer students in 11th and 12th grade should consider developing a separate path for these students that is focused solely on competency-based credit recovery or GED preparation. It may also be necessary to develop alternative accountability frameworks or funding models for these types of programs.

5. Colorado's funding model is based on pupil enrollment in schools and districts during a narrow, 11-day count window at the beginning of the school year. Districts and schools receive funding for these students regardless if they leave later in the school year, and districts and schools who later enroll those students do not receive funding, even though they serve those students for the remainder of the school year. Under this current model, some behaviors that are not always in the best interest of the student are incentivized, including push-out policies after the count window and over-aggressive marketing during the student enrollment period. As students are becoming more mobile, it is recommended that Colorado consider moving to an alternative funding model. Options include funding models based on average daily attendance, multiple count windows or even models where funding follows the student at the course level.

Future Research

The variables which were chosen for the focus of this report were based on previously identified trends and anecdotal observations from the field and proved to be much more complex than originally thought. What this report did provide was a basis for more in-depth future research on the variables that were analyzed at a higher level within this paper, namely individual student mobility and performance of students prior to enrollment in an online school, along with the dramatic changes that the demographics of online schools have undergone in the past eight years. Regretfully, all of the questions that arose during the course of this research could not be answered in this report. However, a few suggested topics and questions for future research include:

1. What are the academic and secondary outcomes of students who transfer into Colorado from another State or Country?

2. Are there other distinguishing characteristics in highly mobile students such as demographics, socioeconomic status, special education or English language learner designation?

3. Which schools are successfully moving students from not proficient to proficient? What are the characteristics of those schools?

4. How many credits does the average secondary student have upon entry into an online school?

5. What strategies are utilized in online schools to retain a higher number of students?

6. What are the post-secondary remediation rates of online students as compared to their brick-and-mortar counterparts?

7. What are the post-secondary remediation rates of students who engage in competency-based essential knowledge and skill recovery versus students who participate in credit recovery?

8. Which online schools are successfully teaching their K-3 students to read?

Endnotes

[i] http://www.cde.state.co.us/coloradoliteracy/cbla/index.asp
[ii] Early Warning! Why Reading by the End of Third Grade Matters (2010) Annie E. Casey Foundation, Baltimore, MD.
[iii] http://www.cde.state.co.us/coloradoliteracy/ReadAct/index.asp
[iv] http://www.cde.state.co.us/cdereval/rv2011DropoutLinks.htm
[v] http://www.cde.state.co.us/onlinelearning/download/MobilityInfo.pdf
[vi] Lefly, D. (2010) Colorado Basic Literacy Act 1997-2010. Colorado Department of Education Research Report. Denver, Co.
[vii] http://www.cde.state.co.us/cdereval/rv2011MobilityLinks.htm