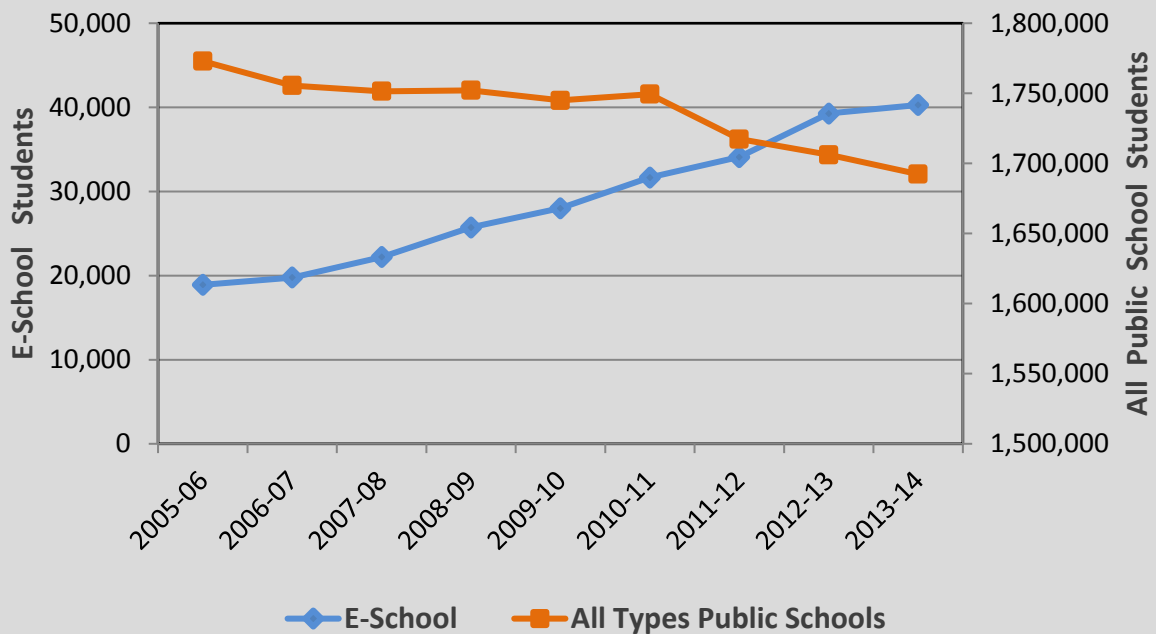


Ohio's E-Schools: An Assessment of Student Demographics, Performance and Dropout Risk

Jay L. Zagorsky, Ph.D. | Lauren Porter, MA

Enrollment in All Types of Ohio Public Schools and in Ohio E-Schools





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Project Team

Jay L. Zagorsky, Ph.D., The Ohio State University (PI)
Lauren Porter, MA, The Ohio State University

Questions regarding this report should be directed to Jay Zagorsky.

Jay L. Zagorsky
Research Scientist
The Ohio State University
(614) 442-7332
Zagorsky.1@osu.edu

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EXECUTIVE SUMMARY

As the importance of school choice has increased so too have the number and types of publicly-funded education choices for Ohio's K-12 students. Technology has played a role in providing new methods for students to learn and schools to teach. In recent years, technology has enabled the development of electronic schools (e-schools), a new type of virtual school where students attend classes from home via the internet. This report provides information on Ohio's e-school students' demographic characteristics, impacts resulting from the transition from a traditional school to an e-school, and the effect e-school enrollment has on a students' dropout risk factor. Highlights of the report are discussed below.

Demographic Characteristics

- E-schools have experienced tremendous enrollment growth while overall public school enrollment has fallen. From the 2005-06 school year to the 2013-14 school year e-school enrollment grew by 113%, while total public school enrollment fell by 5%. Most of the e-school enrollment growth occurred in two statewide e-schools: Electronic Classroom of Tomorrow (ECOT) and Ohio Virtual Academy.
- E-schools primarily serve high school students with 57% of e-school enrollees attending grades 9 to 12, compared to just 31% of Ohio's public school students in the same grades.
- E-schools are slightly less diverse than all public schools. The e-school student population is 78% white, 13% black, 4% Hispanic and 5% other, while the student population in all public schools is comprised of 73% white, 16% black, 5% Hispanic and 7% other.
- In the 2005-06 school year nearly 50% of e-school students were identified as economically disadvantaged. That number has increased to approximately 63% in the 2013-14 school year. While the percentage of students identified as economically disadvantaged in all public schools has also been climbing over time in every year analyzed, a larger fraction of e-school students are identified as economically disadvantaged than in all public schools.
- E-schools have about the same percentage of students with disabilities (~16%) as all public schools (~15%), which has remained fairly consistent over time.
- E-school students transfer from all types of school systems. The most likely type of school an e-school student attended previously was a high poverty, average student population, urban district (19%). The least likely type of school an e-school student attended previously are wealthy suburban school systems (5%), or small, average poverty rural schools districts (5%).

- The majority of e-school students (~75%) had at least one community or vocational school option in their county that served their grade in addition to the e-school in which they enrolled. Approximately 65% of e-school students had more than one community or vocational school option in their county in addition to the e-school in which they enrolled.
- A sizable number of e-school students (27%) go back-and-forth between e-schools and traditional schools instead of continuously attending an e-school. The typical student spends 2 years in a particular e-school.

Comparative Dropout Risk

- E-school students in grades 9 to 12 are over four times more likely to drop out of school than a student with similar characteristics who attends a traditional school. Among students who do drop out, those who attended an e-school stay in the Ohio public school system approximately 4 months longer than dropouts who did not attend an e-school.

Comparative Performance Analysis

- E-school students' performance on standardized tests are dramatically lower, especially for math, compared to those students who attend a traditional school. Test scores plummet the year a student transitions to an e-school. E-school students' scores see incremental increases in the subsequent years. However, it is important to note, that despite subsequent increases their scores remain below the scores they received prior to entering an e-school.

INTRODUCTION

School choice, the availability of different options of publicly funded primary and secondary education, has become an important issue among parents, students and the education community in Ohio. The increase in school choice across the state brings with it the need to understand the student composition and performance of the various types of publicly-funded education institutions. Today, there are 382 publicly-funded charter schools in Ohio, of which 26 are electronic schools (e-schools). These 26 e-schools served 38,502 enrolled students during the October 2014 enrollment headcount (ODE, 2015). Currently, little is known about e-school students, including their demographic characteristics, school history, and the impact transition from a traditional school to an e-school has on academic performance.

A 2010 study found that only eight percent of Ohio's virtual schools were categorized as "Effective" schools and 44.4% of virtual schools were categorized as "Academic Watch" or "Academic Emergency" (Wang & Decker, 2014). Recent work by CREDO has shown reductions in student learning in reading and math for students in charter schools (referred to as "community schools" in Ohio) as opposed to traditional public school students (CREDO, 2014). However, the CREDO report did not distinguish between physical community and virtual community schools. Prior analytical work done by SAS provided detailed group comparisons of the performance of students enrolled in e-schools to a comparison group of students in traditional public schools. Using these group level comparisons, SAS calculated average gains in the Normal Curve Equivalent (NCE) scores for both those that enrolled in e-schools and the comparison group in traditional public schools. Using these data, SAS was able to state that students in virtual schools saw greater reductions in student performance on core subjects such as math (White, ND). White's report did not, however, examine individual student level performance over time.

The analysis in this report extends the previous studies. It presents data from Ohio's School Report Cards' Advanced Reports and Ohio's Education Management Information System (EMIS), obtained through the Ohio Longitudinal Data Archive (OLDA). For the purposes of this report "traditional school" refers to traditional public schools, and "e-schools" refer to publicly chartered schools who teach through online platforms. "All public schools" refers to traditional and chartered public schools in both physical and online settings.

This report advances the analysis of e-school student performance in Ohio by both examining high-level summary data and individual student-level data over time. It provides a comparison between all public school students and four different e-school segments; all e-school students, students in state-wide e-schools, students in dropout recovery e-schools and students in the two largest e-schools (referred to as the Big 2). Providing these five different groups shows not only that the demographic characteristics of e-school students are different than the typical public school student in Ohio and also that e-school students' academic performance and risk of dropping out is also different.

DEMOGRAPHIC INFORMATION

Enrollment

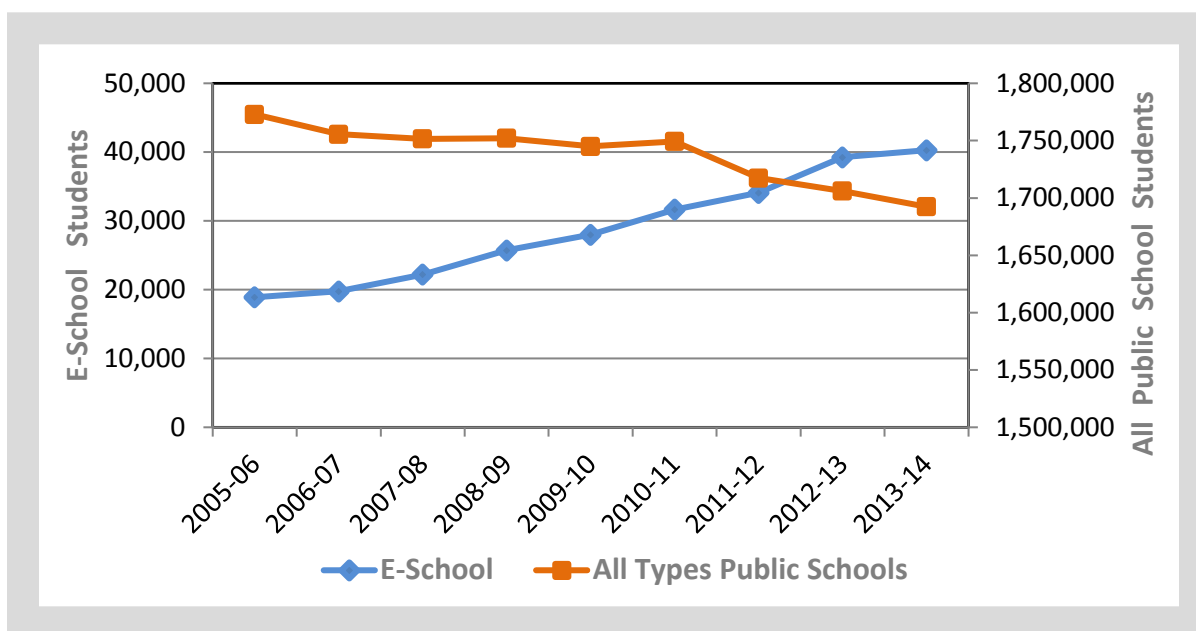
Question: What is the historic and current enrollment in e-schools?

Answer: E-schools have experienced tremendous growth over the last few years, while overall public enrollment has fallen slightly.

Figure 1 tracks enrollment in e-schools and in all types of public schools in Ohio from the 2005-06 school year to the 2013-14 school year. The solid line and left-hand vertical axis shows trends in e-school enrollment. In the 2005-06 school year there were approximately 19,000 students enrolled in Ohio's e-schools. By the 2013-14 school year enrollment in e-schools had climbed to approximately 40,000 students. Over this time period e-school enrollment has roughly doubled (+113%).

While enrollment in Ohio's e-schools has risen sharply, the overall number of students in Ohio's public school system has experienced a decline. The dotted line and right hand vertical axis shows that in the 2005-06 school year there were about 1,773,000 students enrolled in Ohio's public schools. However, by 2013-14 the number of students in Ohio's public schools had fallen to about 1,692,000, a reduction of 5%.

Figure 1. Enrollment in All Types of Ohio Public Schools and in Ohio E-Schools



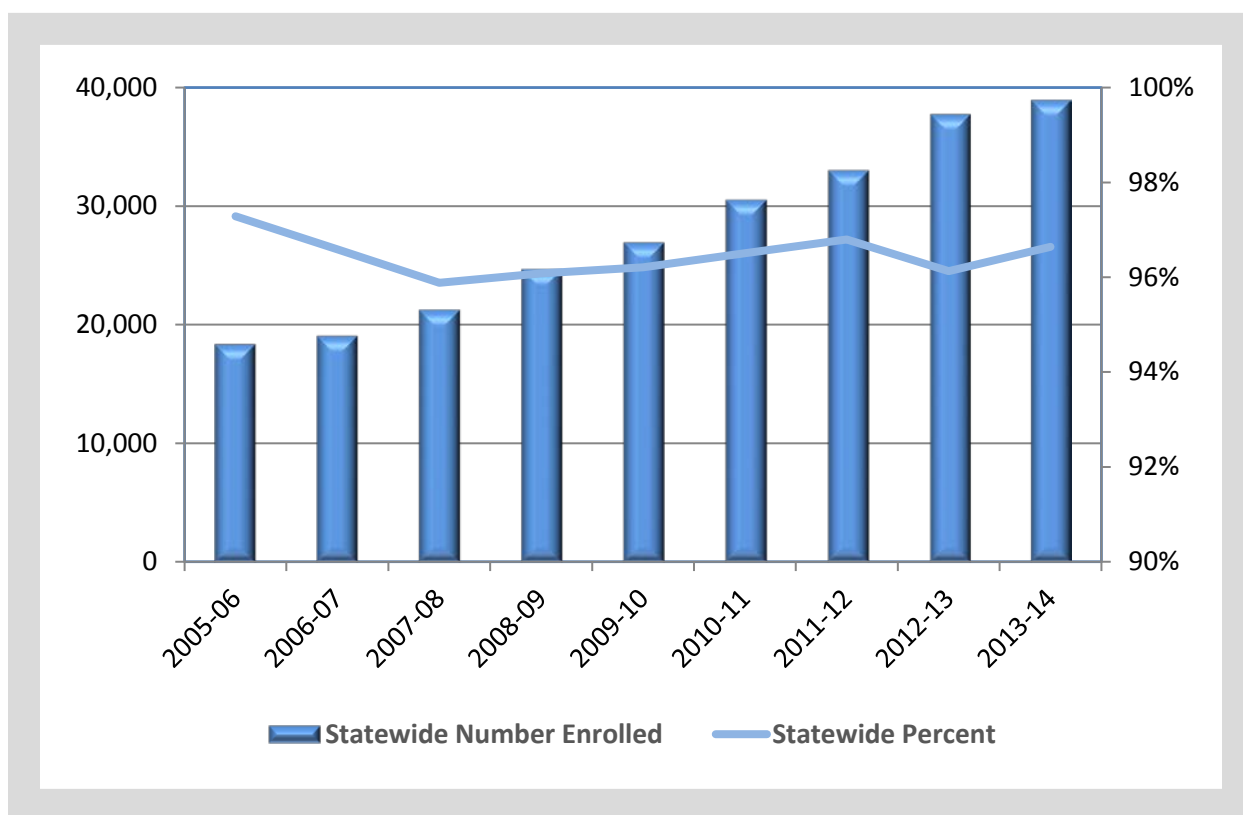
Notes: Data from the Ohio Student Report Cards website's "Enrollment by Student Demographics" (<http://reportcard.education.ohio.gov/Pages/Power-User-Reports.aspx>).

Question: Which type of e-school has seen the largest increase in enrollment?

Answer: Statewide and dropout recover schools capture roughly the same percent of students over time, but the two biggest e-schools have grown dramatically.

This report looks at three different types of e-schools operating in Ohio; statewide, dropout recovery and very large. Statewide e-schools are open to any Ohio student, regardless of where they live, while non-statewide schools restrict entry to only students from a particular school district. The names of all statewide and non-statewide schools are found in table 20 of the Data Appendix at the end of this report. Currently, half of Ohio’s e-schools are statewide academies and half are not. Total enrollment in the statewide e-schools has increased dramatically over time, rising from almost 20,000 students in the 2005-06 school year to almost 40,000 by 2013-14. However, the breakdown between statewide and non-statewide school has stayed relatively fixed, with statewide schools attracting around 97% of all e-school students.

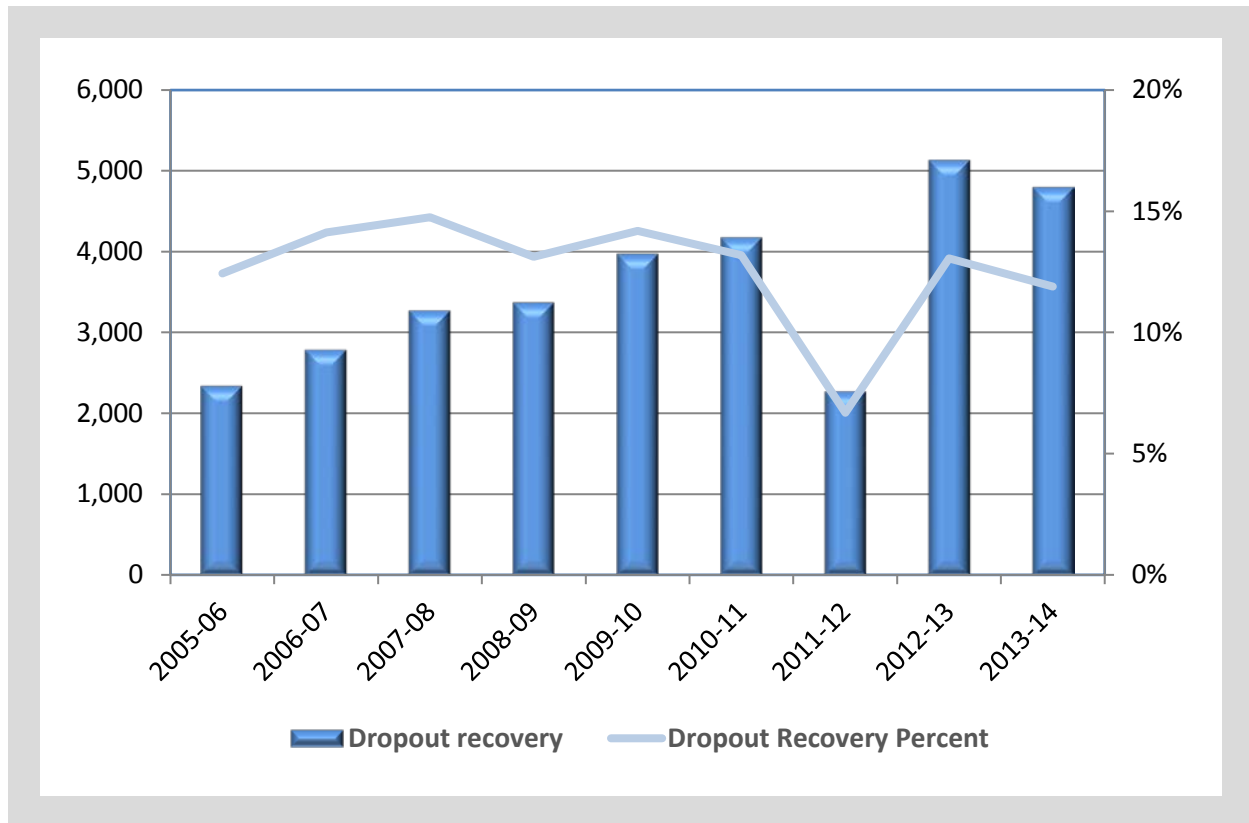
Figure 2. Enrollment in Statewide E-Schools



Dropout recovery e-schools are special schools that allow at-risk students to complete a competency-based instructional program rather than the Ohio core curriculum prescribed by state law. Non-dropout recovery e-schools follow the core curriculum. The names of all dropout recovery e-schools are found in Table 19 of the Data Appendix at the end of this report. While

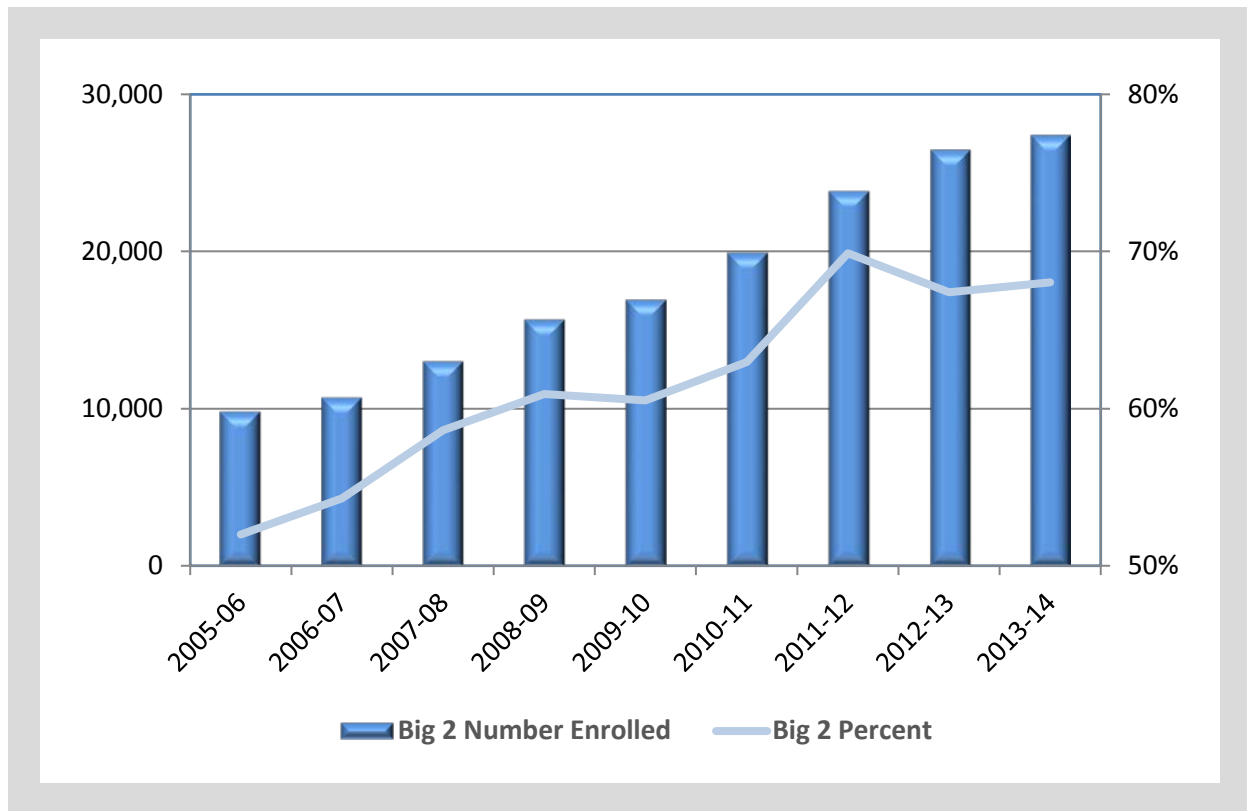
currently, half of Ohio’s e-schools are dropout recovery and half are not, enrollment figures show that dropout recovery e-schools comprise only a small percentage (~13%) of total e-school enrollment.

Figure 3. Enrollment in Dropout Recovery E-Schools



The final type of e-school analyzed is the “Big 2.” While 26 e-schools were analyzed in this report, two of the largest account for the majority of e-school enrollment. Electronic Classroom of Tomorrow (ECOT) and Ohio Virtual Academy (OVA) are broken out separately to determine whether the largest e-schools have different characteristics than the other e-schools with smaller student enrollment. Figure 4 shows that over time the Big 2 are becoming even more dominant as their enrollment has grown from slightly more than half of all e-school students to almost 70% of all e-school enrollment.

Figure 4. Enrollment in the Big 2 E-Schools



Question: Are students attending e-schools for similar lengths of time as in other public schools?

Answer: E-school enrollees spend significantly less time in this form of instruction.

EMIS data tracks how long a student spends in a particular district. Each e-school is classified by the state of Ohio as a separate district. Table 1 below shows the amount of time students spend in e-schools. The most common length of time spent in an e-school is one year. Only a very small number of students spend more than six years in e-schools.

Table 1. Amount of Time Students Spend in E-schools

Years	Percent
1 Year	37%
2 Years	23%
3 Years	16%
4 Years	11%
5 Years	7%
6 Years	6%
7 Years	0.4%
8 Years	0.02%
9 Years	0% (6 students)
10 Years	0% (4 students)
11 Years	0% (2 students)
12 Years	0% (2 students)

Figure 5 below shows the variance in the length of enrollment at a district between e-school students and all public school students. Nearly 70% of e-school students spend only one to three years in a district. However, approximately 55% of all public school students (traditional and chartered public in both physical and online settings) spend three or more years in a district.

Figure 5. Average Percent of Time Spent in Ohio E-Schools and All Public Schools 2005-2014

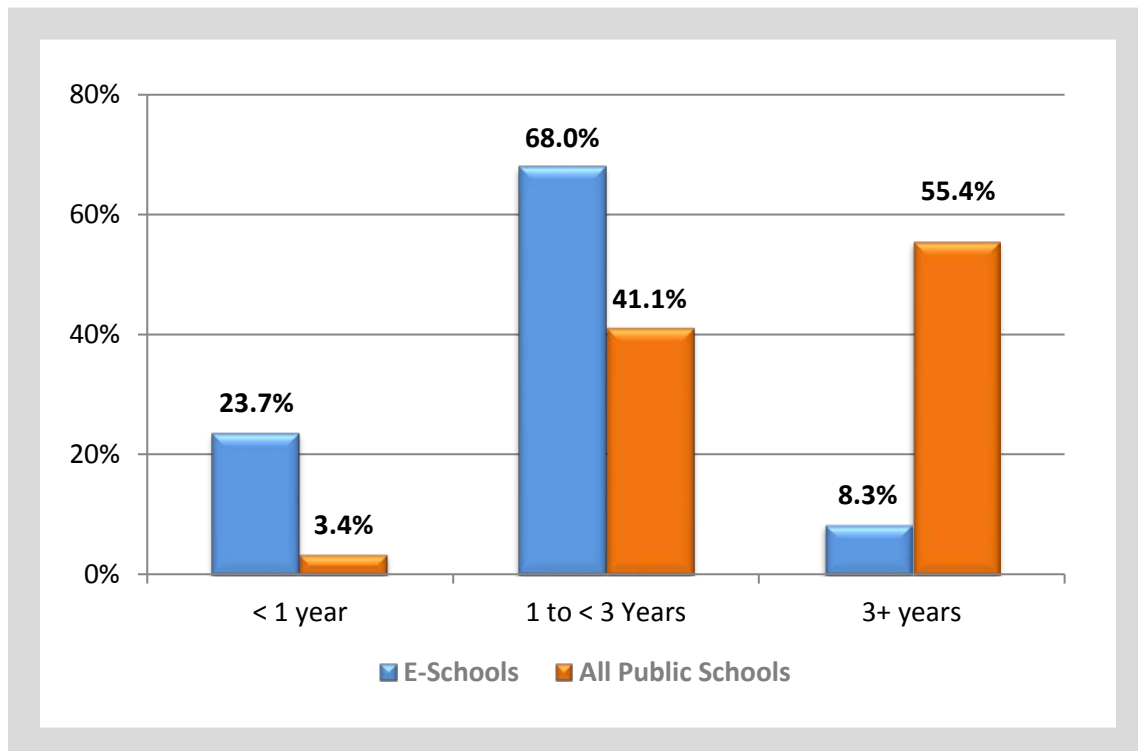


Table 2 shows the percent of students who were enrolled three or more years in a district. In 2013-14 all public schools had 59% of students enrolled in the same district for three or more years. E-schools, however, had dramatically smaller percentages with statewide e-schools having just 13% enrolled for three or more years, dropout recovery schools had 9% and the Big 2 had 12%.

Table 2. Percentage of Students Enrolled Three or More Years in a District

School Year	All Types Public Schools	Statewide E-Schools	Dropout Recovery E-Schools	Big 2 E-Schools
2005-06	54%	5%	3%	5%
2006-07	54%	4%	6%	5%
2007-08	53%	5%	7%	5%
2008-09	55%	10%	2%	11%
2009-10	54%	9%	3%	10%
2010-11	54%	10%	4%	11%
2011-12	58%	11%	8%	11%
2012-13	59%	12%	8%	11%
2013-14	59%	13%	9%	12%

Grade Levels

Question: What grade levels are students enrolled in at e-schools?

Answer: E-schools primarily serve high school students.

Figure 6 shows that about half (57%) of students enrolled in e-schools are attending grades 9 through 12. In all of Ohio's public schools, however, just 31% of students are enrolled in grades 9 to 12. Figure 6 shows that students in all public schools are dispersed fairly evenly across kindergarten through 12th grade (between 6-8% per grade). Conversely, e-schools have an uneven distribution of students per grade level. In e-schools, the percent of students in each grade from kindergarten to 5th grade is relatively small at less than 4%. However, the percent of students in high school (grades 9-12) is significantly higher at 12-16%.

Figure 6. Percent in Each Grade for Ohio E-Schools and All Public Schools 2013-14

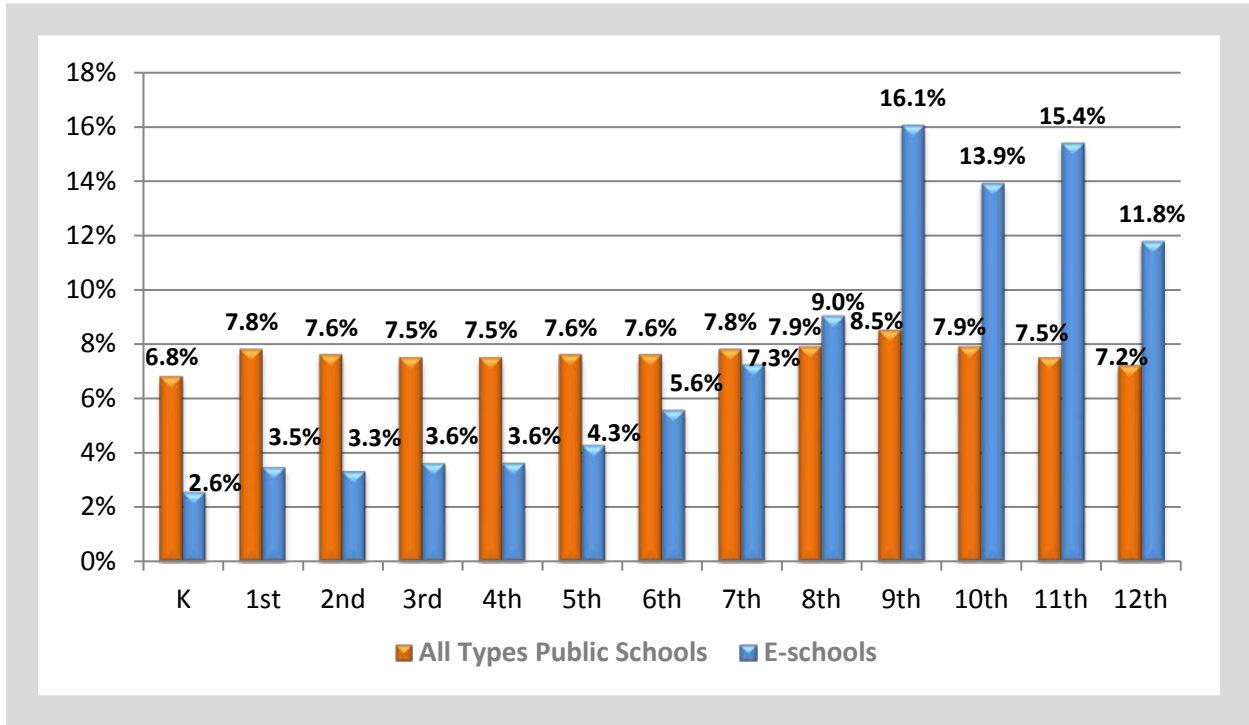


Table 3 breaks down the grade levels students are attending into a number of different categories. The first column, labeled “All Types Public Schools” provides the specific figures used in Figure 6 and provides a comparison for the other three columns. The other three columns show that e-schools predominately educate students from 9th to 12th grade. Dropout recovery schools focus the most on these grades, with statewide e-schools focusing second most and the Big 2 e-schools focusing the least.

Table 3. Number and Percentage of Enrollment by Grade

Grade Level	All Types Public Schools	Statewide E-Schools	Dropout Recovery E-Schools	Big 2 E-Schools
1st	7.8%	3.6%	1.3%	3.8%
2nd	7.6%	3.4%	1.1%	3.6%
3rd	7.5%	3.7%	0.9%	3.9%
4th	7.5%	3.7%	1.5%	3.9%
5th	7.6%	4.4%	2.1%	4.6%
6th	7.6%	5.7%	2.8%	5.6%
7th	7.8%	7.4%	4.9%	7.2%
8th	7.9%	9.2%	6.7%	9.2%
9th	8.5%	16.0%	19.8%	14.6%
10th	7.9%	13.6%	14.7%	14.0%
11th	7.5%	15.2%	24.9%	15.1%
12th	7.2%	11.2%	17.7%	11.9%

Question: What grade levels do students enter and leave e-schools?

Answer: The most likely grade level for a student to enter is 9th and the most likely for them to leave is 12th.

By examining student history it is possible to determine the first grade level a student attends and the last grade level a student attends at an e-school. Table 4 below depicts the percentage of students entering and leaving e-schools, by grade level, for all e-school students in Ohio. The 24% of 12th graders leaving e-schools includes those leaving due to graduation.

Table 4. Percent of Students Entering and Leaving E-Schools by Grade Level, All E-School Students

Grade Level	Percent Entering	Percent Leaving
Kindergarten	6%	2%
1 st Grade	3%	2%
2 nd Grade	3%	2%
3 rd Grade	3%	3%
4 th Grade	4%	3%
5 th Grade	5%	3%
6 th Grade	6%	4%
7 th Grade	8%	5%
8 th Grade	9%	6%
9 th Grade	20%	15%
10 th Grade	13%	13%
11 th Grade	12%	17%
12 th Grade	7%	24%

Student School District History

The Center for Human Resource Research (CHRR) at The Ohio State University manages a large database, the Ohio Longitudinal Data Archive (OLDA), which links all EMIS files from 2003 to 2014. All EMIS files in the OLDA are de-identified. Currently, the OLDA contains data on over 4.1 million Ohio students. Each student record has multiple data points and contains a historical record of student enrollment and performance. For some students, such as those that attend the same school for all years (K-12) each student record has relatively little data. While other student records, for students who have attended several different districts or have a number of disciplinary events, there is a larger amount of information. Using individual student history it is possible to answer more detailed questions than is possible from examining cross-sectional demographic information.

Question: Do e-school students transfer in from a specific type of public school?

Answer: First year e-school students come from all types of public schools.

Having a student history provides a simple way to determine the type of school a student was attending in the year before they transferred into an e-school. Ohio has created an eight item typology for classifying all schools and districts.¹

Combining the typology and each e-school students' history creates Table 5, which shows the most likely type of school an e-school student attended previously was a high poverty, average student population, urban district (19%). The least likely traditional school an e-school student comes from is a wealthy suburban school district (5%) or small, average poverty, rural schools districts (5%).

¹ <http://education.ohio.gov/Topics/Data/Frequently-Requested-Data/Typology-of-Ohio-School-Districts>

Table 5. Type of School E-School Student Attended in Prior Year

Type of School	Percent
Rural (High Pov. & Small Pop.)	10%
Rural (Avg. Pov. & Very Small Pop.)	5%
Small Town (Low Pov. & Small Pop.)	9%
Small Town (High Pov. & Avg. Pop.)	13%
Suburban (Low Pov. & Avg. Pop.)	14%
Suburban (Very Low Pov. & Large Pop)	5%
Urban (High Pov. & Avg. Student Pop)	19%
Urban (Very High Pov & Very Large Pop)	15%
Community / Charter School	10%

Question: How much choice in public schools did e-school students have?

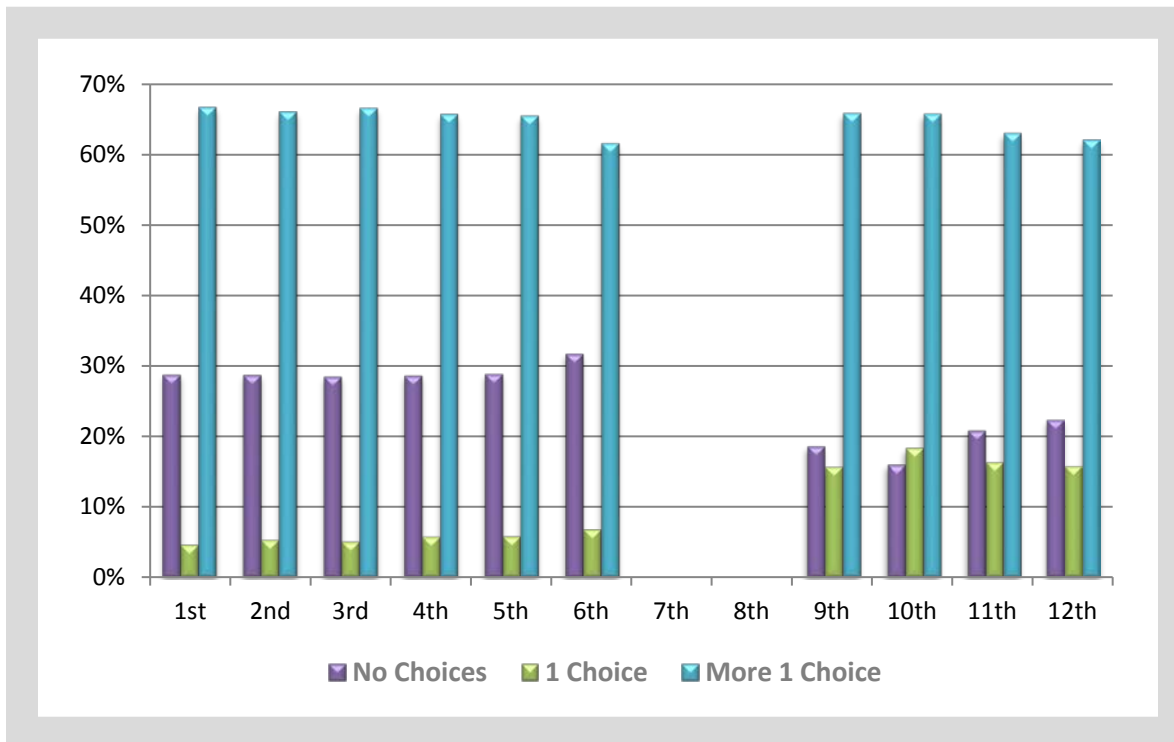
Answer: About three-quarters of students had a variety of educational options in their county.

One potential reason for the dramatic rise in e-school enrollment is that students attending traditional schools have no other public school choice except an e-school. Figure 7 show that this is not the case for most e-school enrollees. Figure 7 assesses the amount of school choice available to each e-school enrollee in their county. School choice is defined as the number of community or vocational schools offering the child’s grade level. Because some 7th and 8th grade schools are part of elementary schools and some are standalone, the data for 7th and 8th grade are not shown.

Figure 7 shows, that for grades one through six, about 30% of e-school enrollees had no brick-and-mortar community school option available in their county. Because vocational schools provide additional options to older students, approximately 20% of e-school enrollees in 9th to 12th grade had no brick-and-mortar community or vocational school option available in their county. Combining 1st to 12th grade shows that approximately 25% of all e-school enrollees were faced between attending an e-school or continuing to attend their local traditional public school.

While about 25% of e-school enrollees had no brick-and-mortar community or vocational school choices, 75% did have a brick-and-mortar choice. A relatively small number (10% of all e-school enrollees) had just one brick-and-mortar community or vocational school choice in their county. Roughly 65% of all e-school enrollees, however, had more than one brick-and-mortar community school or vocational school option available in their county.

Figure 7. Percent of E-School Students Who Could Attend a Community or Vocational School



Question: Once enrolled, do e-school students remain in that e-school?

Answer: Most e-school students are unlikely to change e-schools or go back and forth between an e-school and traditional school.

An analysis of the longitudinal EMIS histories showed that only 7% of e-school students had attended more than one e-school. In addition, analysis of the longitudinal EMIS histories for all students who attended an e-school for more than one year revealed that only about 27% returned to a traditional school before leaving again and re-enrolling in an e-school. Once enrolled in an e-school, most students remain in that school until they graduate or dropout of school.

Socioeconomic Characteristics

Question: What is the economic status of e-school students?

Answer: E-school enrollees are much more economically disadvantaged than all public school students.

Each student record in Ohio's EMIS database is classified as economically disadvantaged or not. A student is classified as economically disadvantaged if he or she: 1) participates in the free or reduced price lunch program, 2) resides in a household in which a member is eligible for free or

reduced price lunch, 3) receive public assistance directly or whose guardians receive public assistance, or 4) has had a Title 1 student income form completed and met the income guidelines specified through Title 1. It is important to note that some students who may qualify are not classified as economically disadvantaged because they have not applied for any of the programs that would classify them as economically disadvantaged. Specifically, some e-school students do not apply for the free or reduced price lunches because the program is not available through online schools. If most e-school students are transferring from a traditional school then any students that have participated in the free and reduced price lunch program will have the economically disadvantage marker on their student record. In this case, the data accurately depicts economically disadvantaged status for students in their first year at an e-school. However, the economic disadvantage flag is reported every year, so if a student transitions from a school in which they qualify for free or reduced price lunch to an e-school where this program is not available, the economic disadvantage flag would be removed for this student in their first full year of e-school enrollment unless they qualify under 1 of the 3 additional classifications of economic disadvantage status. As a result, the true picture of the percent of disadvantaged students in the e-school system is unclear.

Figure 8 displays the change in the percent of students classified as economically disadvantaged in Ohio’s e-schools and all Ohio public schools. The graph shows that roughly half of all e-school students were classified as economically disadvantaged in the 2005-2006 school year. The percentage has risen over time and by 2013-14 was roughly two-thirds. In all public schools in Ohio the amount of poverty has also been steadily growing. In 2005-2006 about one third of all students were classified as economically disadvantaged. This number climbed to about 50% in 2013-14.

Figure 8. Percent of Students who are Economically Disadvantaged in Ohio E-Schools and All Public Schools

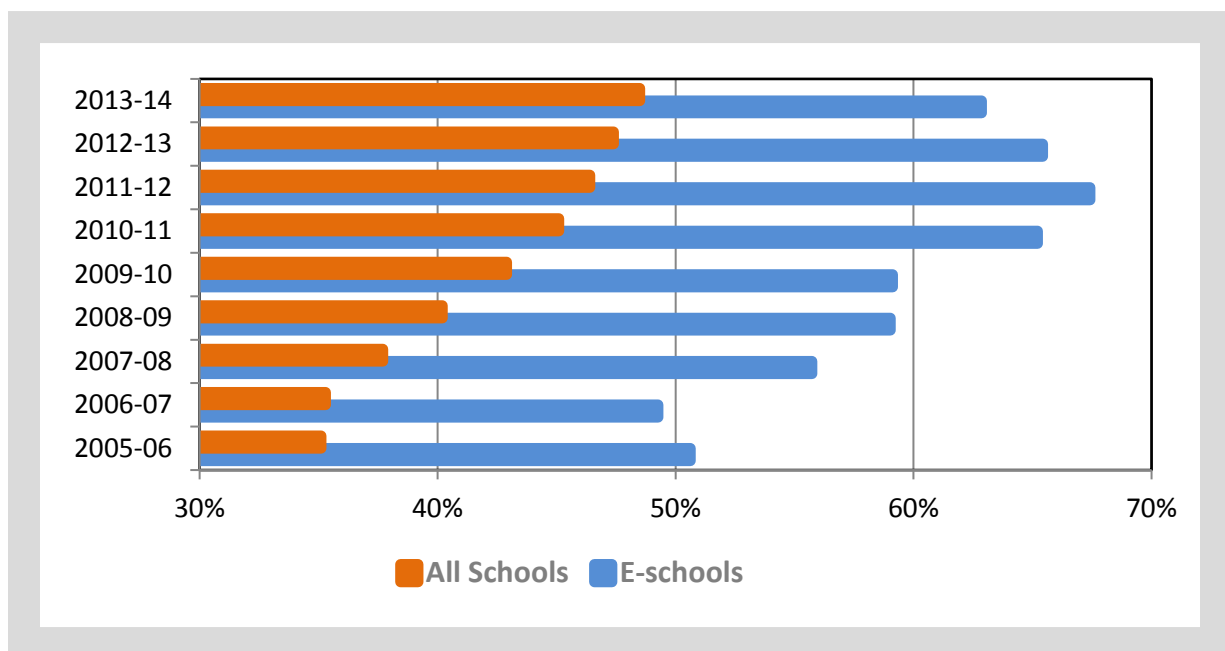


Table 6 shows the percent of students classified as economically disadvantaged in all public schools and in the three e-school classifications. In 2013-14 all public schools had the smallest percentage of economically disadvantaged students (48.5%). Compared to all public school students, dropout recovery e-schools had roughly ten percentage points more (57.1%) and statewide e-schools had roughly fifteen percentage points more (63%). The Big 2 in 2013-14 had the largest concentration of economically disadvantaged with roughly two-thirds (66.3%) being in the classification.

Table 6. Percentage of Economically Disadvantaged Students by Year

School Year	All Types Public Schools	Statewide E-Schools	Dropout Recovery E-Schools	Big 2 E-Schools
2005-06	35.1%	50.8%	43.5%	63.3%
2006-07	35.3%	49.1%	32.5%	64.2%
2007-08	37.7%	55.4%	51.6%	60.1%
2008-09	40.2%	59.3%	54.2%	61.1%
2009-10	42.9%	59.0%	60.9%	60.8%
2010-11	45.1%	65.4%	71.3%	66.6%
2011-12	46.4%	67.7%	66.8%	71.2%
2012-13	47.4%	65.6%	64.1%	67.8%
2013-14	48.5%	63.0%	57.1%	66.3%

Question: What is the racial and ethnic composition of students attending e-schools?

Answer: E-school students are overwhelmingly white and slightly less diverse than all public school students.

Figure 9 shows the racial and ethnic composition of students in e-schools and in all public schools during the 2013-2014 school year. In 2013-14 about 78% of e-school students were white, non-Hispanic (Figure 10). The percentage of white, non-Hispanic students in e-schools is about five percentage points higher than the percentage of white, non-Hispanic students (73%) in all of Ohio's public schools. E-schools have a slightly smaller percentage of black students (13%) than in all public schools (16%) and a slightly smaller percentage of Hispanic students (4%) than in all public schools (5%). E-schools have a slightly smaller percentage (5%) of other races and ethnicities, which include Native American, Asian and mixed race students than all public schools (7%).

Figure 9. Percent by Race and Ethnicity in Ohio E-Schools and All Public Schools in 2013-14

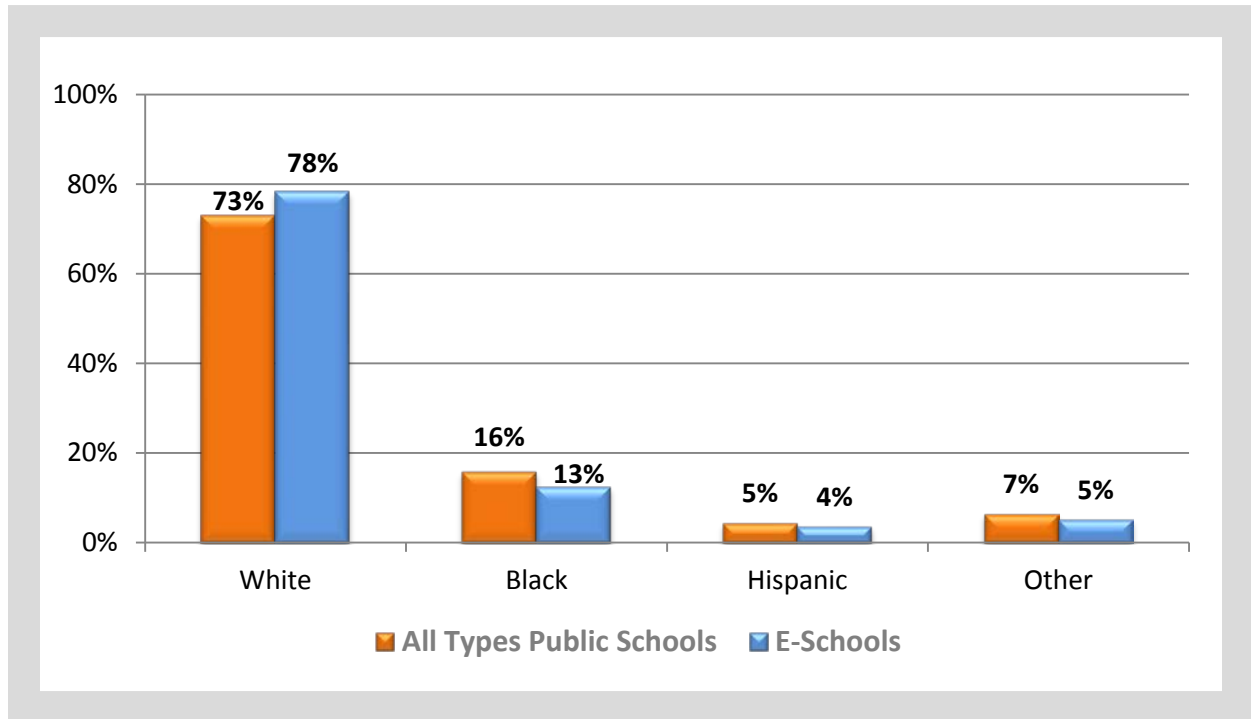


Table 7 shows the percent of students classified as white in all public schools and in the three e-school classifications. Over time the student populations of all public schools, statewide e-schools and the two biggest e-schools are becoming less white. Dropout recovery schools show no trend over time.

Table 7. Percentage of White Students by Year

School Year	All Types Public Schools	Statewide E-Schools	Dropout Recovery E-Schools	Big 2 E-Schools
2005-06	77%	82%	82%	84%
2006-07	76%	82%	81%	84%
2007-08	76%	82%	81%	83%
2008-09	76%	78%	82%	77%
2009-10	75%	80%	81%	80%
2010-11	74%	78%	78%	78%
2011-12	74%	78%	78%	78%
2012-13	74%	78%	83%	77%
2013-14	73%	78%	83%	78%

Question: Do e-schools have any Limited English Proficiency (LEP) students enrolled?

Answer: Yes, although the number of LEP students is very small.

Ohio public schools record if a student has been classified as Limited English Proficiency (LEP). The number of LEP students in all Ohio public schools is relatively small, comprising only 2.7% of total enrollment in the 2013-14 school year. E-schools, which require a child to speak on the telephone and type responses on a computer, have even fewer LEP students, comprising only 0.2% of total e-school enrollment in the 2013-14 school year. All LEP e-school students attend classes in just three e-schools; 61 LEP students attend ECOT, 44 attend Ohio Virtual Academy and 12 attend Ohio Connections Academy.

Question: Do e-schools serve a disproportionate number of students with disabilities compared to all public schools?

Answer: No. E-schools serve a slightly higher number of students with disabilities than all public schools.

Ohio public schools record students that were serviced with an Individualized Education Plan (IEP) as students with disabilities. Figure 10 shows that in the 2013-14 school year e-schools had a slightly higher percentage of students with disabilities (16.4% disabled) than all public schools (14.7% disabled). The difference, however, between the population size in e-schools and all public schools is rather small (~1.7%). In addition, the difference in population size has remained fairly consistent from the 2005-06 school year through the 2013-14 school year.

Figure 10. Disability Status in Ohio's E-Schools and All Public Schools

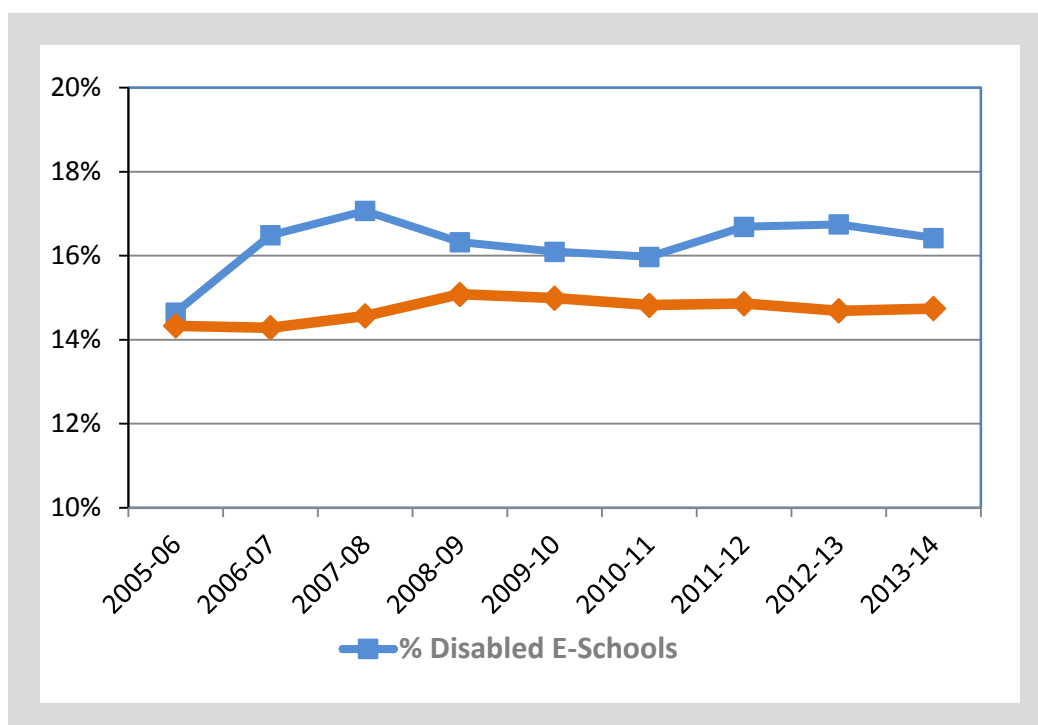


Table 8 shows the percent of students with disabilities in all public schools and in the three e-school classifications. In 2013-14 all public schools had the smallest percentage of students with disabilities (14.7%). Compared to all public school students, dropout recovery e-schools had the roughly five percentage points more (19.7%) students with disabilities. Statewide e-schools and the Big 2 ranked between dropout recovery and all public schools with roughly 16%-17% of their students classified as disabled.

Table 8. Percentage of Students with Disabilities by Year

School Year	All Types Public Schools	Statewide E-Schools	Dropout Recovery E-Schools	Big 2 E-Schools
2005-06	14.3%	14.6%	19.3%	13.8%
2006-07	14.3%	16.7%	18.9%	16.1%
2007-08	14.6%	17.2%	19.0%	16.5%
2008-09	15.1%	16.2%	20.3%	15.4%
2009-10	15.0%	16.0%	19.2%	15.3%
2010-11	14.8%	15.9%	18.7%	16.0%
2011-12	14.9%	16.6%	19.3%	16.8%
2012-13	14.7%	16.7%	18.3%	16.9%
2013-14	14.7%	16.3%	19.7%	17.0%

Table 9 depicts the enrollment of students by specific disability for the 2013-14 school year. The table shows that e-schools have slightly more students with specific learning disabilities (7.6%) than all public schools (6.1%).

Table 9. Percentage of Enrollment by Type of Disability in E-Schools and All Public Schools

Type of Disability	All Schools	E-Schools	Difference
No Disability	85.3%	84.2%	-1.1%
Specific Learning Disabilities	6.1%	7.6%	1.5%
Other Health Impaired - Minor	2.2%	2.8%	0.6%
Speech and Language Impairments	1.7%	0.7%	-1.0%
Cognitive Disabilities	1.3%	1.7%	0.4%
Emotional Disturbance (SBH)	1.0%	1.4%	0.4%
Autism	1.0%	1.0%	0.0%
Multiple Disabilities (other than Deaf-Blind)	0.8%	0.3%	-0.5%
Developmental Delay	0.2%	0.0%	-0.2%
Deafness (Hearing Impairments)	0.1%	0.1%	0.0%
Visual Impairments	0.1%	0.0%	-0.1%
Orthopedic Impairments	0.1%	0.1%	0.0%
Traumatic Brain Injury (TBI)	0.1%	0.1%	0.0%

Question: What is the enrollment of homeless students in e-schools?

Answer: A very small number of homeless students attend e-schools.

Student records contain a marker for homelessness if a student is homeless or living in a temporary housing situation like a hotel or motel. In all public schools, homeless students comprise a relatively small percent of the student population at only 1.1% of total enrollment. E-schools, which require a telephone and a relatively high speed computer connection, have even fewer homeless students, which represented only 0.5% of total enrollment in the 2013-14 school year.

COMPARATIVE DROPOUT RISK

Question: Are e-school students at a higher, lower or similar risk for dropping out of school?

Answer: E-schools students in grades 9 through 12 are over 4 times more likely to drop out than a student with similar characteristics who attends a traditional school.

The Ohio Department of Education (ODE) has supported the creation of a Student Success Dashboard for Ohio public school students. The Student Success Dashboard uses a statistical model that includes roughly 40 different indicators to predict a students' risk of dropping out of high school. A student is flagged as a dropout if EMIS data shows they withdrew due to truancy or nonattendance, left to pursue employment, left school after age 18,, not known to have continued schooling or completed courses but failed the Ohio Graduation Test. The set of indicators used in the 9th grade Student Success Dashboard model are displayed in Table 10.

Table 10. Factors Used in the Student Success Dashboard

Demographic	Behavioral	Academic
Is Female	More than 10 Absences in Year	Academically gifted
Age	Unexcused Absences as % Attendance	Attend Rural School
Is Black	# Excused Absences	Attend School in a Small Town
Is Hispanic	# Unexcused Absences	Attend a Suburban School
Is Other Race	# Days Attended School	8 th grade Test Bottom Quintile of Reading
Homeless During Year	# of Days Disciplined	8 th Grade Test Bottom Quintile Math
Previously Homeless	# of Times Disciplined	8 th Grade Test Top Quintile Reading
Currently Disabled	# Discipline Days for all Years Prior	8 th Grade Test Top Quintile Math
Ever Limited English	# Times Disciplined for all Years Prior	7 th Grade Test Bottom Quintile in Reading
Poor	Missed Taking Std Test in 8 th Grade	7 th Grade Test Bottom Quintile in Math
	Missed Taking Std Test in 7 th Grade	7 th Grade Test Top Quintile in Reading
	# Schools Attended During Year	7 th Grade Test Top Quintile in Math
	# Times Student changed Type of School	Ever Repeat a Grade
		Ever Skip a Grade
		# Years in Ohio Schools
		Calendar Year

An additional variable was added to the model to track e-school attendance to understand the impact enrollment in an e-school has on a students' risk of dropping out. Table 11 below contains the odds-ratio on dropping out for e-school students in grades 9 through 12. The odds-ratio compares the chance an e-school student drops out to the chance a student attending a traditional school drops out. For example, the 5.2 in the row labeled 9th grade indicates that an e-school student is over five times more likely to drop out of school than a student enrolled in a traditional school with the same demographic, behavioral and academic characteristics. The average of the odds-ratio column is 4.2, which suggests that e-school students are over four times more likely to drop out of school than their peers in a traditional school.

Table 11. Odds-Ratio from Student Success Dashboard

Grade	Odds-Ratio	Lower 95% Range	Upper 95% Range	Explanation
9 th	5.4	5.2	5.6	9 th grade e-school student is 5.2 to 5.6 times more likely to drop out of school as someone with identical characteristics, like age, gender and test score but who attends a traditional school
10 th	3.7	3.6	3.9	10 th grade e-school student is 3.6 to 3.9 times more likely to drop out
11 th	4.6	4.5	4.8	11 th grade e-school student is 4.5 to 4.8 times more likely to drop out
12 th	3.1	3.0	3.2	12 th grade e-school student is 3.0 to 3.2 times more likely to drop out

Question: Do e-schools retain dropouts in school longer than other public schools?

Answer: High school dropouts who attend an e-school stay in the Ohio public school system approximately half a school year (4+ months) longer than dropouts who do not go to an e-school.

Data from the longitudinal EMIS system can calculate how long a student spends in high school. While the goal is for each student to spend four years in high school and then graduate, some students repeat grades and spend more time in school, while other students drop out of high school and spend less time in school. Table 12 analyzes the average amount of time dropouts spent in high school for both e-school dropouts and dropouts who never attended an e-school. Table 8 indicates that e-school attendance increases the amount of time a student spends in the Ohio public school system by roughly half a school year, which is slightly more than 4 months of class time.

Table 12. Number of Years Spent in High School

Type	School Years
E-school Dropouts	3.52
Dropouts Never Attended E-School	3.03
Difference	0.49

To check the above result, a regression model was run that examines the number of years a dropout student spends in high school using the demographic factors of gender, age, race, ethnicity and economically disadvantaged status. The results of this model indicated that being in an e-school increased the amount of time a student spent in high school by approximately 0.48 school years. This result supports the above analysis, which showed that e-school students spend 0.49 school years more in public schools.

COMPARATIVE PERFORMANCE ANALYSIS

Question: How do e-school students perform on standardized tests compared to their peers in traditional schools?

Answer: Overall, e-school students test scores are dramatically lower, especially for math.

The SAS Institute previously did an analysis that compared traditional school students and e-school students. They found that test scores were dramatically lower for e-school students. This report uses a similar style of analysis. However, because the authors of this report have a full academic history for each student, this analysis is able to examine the performance of students by school enrollment history. School history allows for students to be placed into three categories: (1) always enrolled in a traditional school, (2) always enrolled in an e-school from 3rd to 8th grade, which comprises about 660 students, and (3) enrolled in a traditional school then enrolled in an e-school any time between 3rd and 8th grade.

Table 13 shows the Normal Curve Equivalent (NCE) scores for reading and math in grades three through eight. NCE scores run from 0 to 100, which indicate how a student has scored in a tested subject compared to their grade-level peers; NCE scores indicate how many students out of a hundred had a lower score than the student in question. Table 13 was created using results from the SAS Institute's prior analysis using NCE scores. Table 14 shows reading and math scores in percentiles for grades three through eight. A percentile score close to 0% indicates a student scores poorly in the tested subject, while scores close to 100% indicates he or she scores well in the tested subject.

Reading and math NCE scores for students always enrolled in traditional schools start at 51 NCE or the 52nd percentile and show steady improvement with grade level progression. The reading NCE score for students always enrolled in an e-school starts lower at 48 NCE or the 48th percentile and sees a fairly steady improvement with grade level progression. The math NCE score for students always enrolled in an e-school starts significantly lower at 40 NCE or the 36th percentile and shows a steady improvement with grade level progression. It is important to note, however, that although students always enrolled in an e-school see improvements in their NCE scores in reading and math, their scores start out lower and remain lower than their peers who were always enrolled in a traditional school.

Performance in reading and math for students who have attended both traditional schools and e-schools is low and has a negative trend with grade level progression. This includes students who went from traditional public schools to e-school as well as those students who went from e-schools to traditional public schools and then back to any e-school. The reading NCE score for students who have attend both types of schools begins at 45 NCE and has a steady decline to 39 NCE by the 8th grade. The math NCE score for students who have attended both types of schools begins at 40 NCE and has a steady decline to 35 NCE in the 8th grade. Compared to their 8th grade peers who always

attended a traditional school, the NCE score for these students is 13.8 points lower in reading and 18 points lower in math.

Table 13. Average Reading and Math Using SAS Institute's NCE Score

Test Grade	Reading			Math		
	Always in Traditional School	In Both Trad. & E-School	Always in E-school	Always in Traditional School	In Both Trad. & E-School	Always in E-school
3rd Grade	51.4	45.3	47.9	51.3	39.9	39.7
4th Grade	51.6	43.5	48.0	51.7	39.4	41.8
5th Grade	51.8	43.0	48.5	52.0	39.0	43.8
6th Grade	52.1	41.8	48.8	52.3	38.0	45.6
7th Grade	52.4	41.8	50.8	52.7	37.6	46.2
8th Grade	52.5	38.7	50.9	52.9	34.9	47.5

Table 14. Average Reading and Math Percentile Score (0%-100%) Using ODE Score

Test Grade	Reading			Math		
	Always in Traditional School	In Both Trad. & E-School	Always in E-school	Always in Traditional School	In Both Trad. & E-School	Always in E-school
3rd Grade	51.9%	43.7%	47.7%	51.8%	36.4%	36.5%
4th Grade	52.2%	41.2%	47.7%	52.3%	35.5%	39.0%
5th Grade	52.6%	40.4%	48.1%	52.8%	34.8%	41.5%
6th Grade	53.0%	38.7%	48.4%	53.2%	33.2%	43.9%
7th Grade	53.4%	38.6%	51.2%	53.8%	32.5%	45.0%
8th Grade	53.6%	34.1%	51.0%	54.1%	28.6%	47.0%

Question: What happens to students' test scores when they transition from traditional school to an e-school?

Answer: Test scores plummet the year a student transitions to an e-school. Despite subsequent increases students' scores do not recover after 5 years.

This section examines the change in students NCE and percentile test scores in the year the student transitioned to an e-school and yearly changes for five years after the transition. For example, if a student enrolled in a traditional school in 3rd grade was ranked in the 60th percentile in reading but transitioned to an e-school and in 4th grade was ranked in the 50th percentile their point change

would be -10. Conversely, if a student was ranked in the 40th percentile and the following year was ranked in the 43rd percentile they would have a +3 point change.

Table 15 below shows that in the year the student transitioned from a traditional school to an e-school the typical (mean) student lost about 3.5 NCE points in reading and 5.2 points in math. In the first year of transition to an e-school students experience a significant drop in their NCE scores for both reading and math. In general, for students who stay in an e-school over the subsequent five years the mean student experiences small increases in their NCE scores for both reading and math. However, it is important to note, that despite subsequent increases, the mean student never recovers from the initial drop in their NCE scores. For reading, in the fifth year after transition, the average student is 0.58 points below their NCE score prior to transferring to the e-school. For math, in the fifth year after transition, the average student is 2 points below their NCE score prior to transferring to the e-school.

Table 15. Change in Math and Reading Test Scores by Students Switching into E-Schools

Year	Point Change in Reading NCE Score	Point Change in Math NCE Score	Point Change in Reading Percentile Score	Point Change in Math Percentile Score	Number of Students
Year of Transition To E-school	-3.5 Points	-5.2 Points	-4.8 Pct. Points	-7.1 Pct. Points	37,352
1 Year after Transition	+1.2	+1.7	+1.6	+2.2	30,057
2 Years after Transition	+0.6	+0.6	+0.8	+0.9	16,305
3 Years after Transition	-0.03	+0.3	-0.1	+0.5	9,927
4 Years after Transition	+1.1	+0.3	+1.7	+0.6	4,537
5 Years after Transition	+0.06	+0.3	+0.1	+0.7	1,161

One possibility is that the drop in scores could be caused by students having great difficulty in making the adjustment leaving a traditional school and moving to a different type of educational environment. To check if this is the case, the analysis was rerun, except that only students who switched into a regular community school were used, instead of students who switched into an e-school.

The results in Table 16 show the first transition year does result in a test score drop. However, the drop is quite small in both absolute terms and in comparison to the drop shown in Table 15. In addition a large rise in test scores comes 3 years after the transition for students switching into

community schools. This is one year sooner than seen in Table 15, which shows e-school students get a test score boost in their 4th year after the transition.

Table 16. Change in Math and Reading Scores by Students Switching into Community Schools

Year	Point Change in Reading NCE Score	Point Change in Math NCE Score	Point Change in Reading Percentile Score	Point Change in Math Percentile Score	Number of Students
Year of Transition To Community School	-0.3 Points	-0.1 Points	-0.4 Pct. Points	-0.3 Pct. Points	37,833
1 Year after Transition	-0.1	-0.1	-0.2	-0.3	56,269
2 Years after Transition	+0.2	+0.5	+0.2	+0.6	32,054
3 Years after Transition	+1.2	+1.0	+1.6	+1.4	17,041

DATA APPENDIX

Section - Basic Demographic Facts: All data from this section came from the Ohio's School Report Cards' Advanced Reports system that is available online at <http://reportcard.education.ohio.gov>. The data for each question in this section were taken by first picking "Advanced Reports" and then "Enrollment" at the previous URL.

The data on e-schools came from "Enrollment by Student Demographic (District)" while the data on all schools came from "Enrollment by Student Demographic (State)." The 26 e-schools used in this section are found in Table 17 below.

Table 17. List of E-Schools Included in this Report

IRN	E-School Name	Grades	County	Big 2
149054	Akron Digital Academy	K-12	Summit	
143396	Alternative Education Academy	K-12	Lucas	
288	Auglaize County Educational Academy	K-12	Allen	
417	Buckeye On-Line School for Success	K-12	Columbiana	
151076	Cardington Lincoln Local Digital Acad.	6-12	Morrow	
133413	Electronic Classroom Of Tomorrow	K-12	Franklin	YES
149088	Fairborn Digital Academy	9-12	Greene	
402	Findlay Digital Academy	9-12	Hancock	
149047	Goal Digital Academy	K-12	Morrow	
282	Greater Ohio Virtual	7-12	Warren	
14081	Insight School of Ohio	K-12	Franklin	
151233	Lakewood Digital Academy	K-12	Licking	
151142	Lorain K-12 Digital Academy	9-12	Lorain	
148999	Mahoning Unlimited Classroom	4-12	Mahoning	
148916	Marion City Digital Academy	K-12	Marion	
149427	Massillon Digital Academy, Inc	K-12	Stark	
14136	Mosaica Online of Ohio	K-12		
162	Newark Digital Academy	K-12	Licking	
236	Ohio Connections Academy, Inc	K-12	Cuyahoga	
142950	Ohio Virtual Academy	K-12	Lucas	YES
14148	Provost Academy Ohio	K-12	Franklin	
241	Quaker Digital Academy	K-12	Tuscarawas	
149336	Southwest Licking Digital Academy	K-12	Licking	
143305	Treca Digital Academy	K-12	Marion	
143537	Virtual Community School Of Ohio	K-12	Franklin	
151175	West Central Learning Academy II	7-12	Allen	

Not all data requests to the Ohio's School Report Cards' Advanced Reports system provided complete information. For example, two e-schools Lakewood Digital and Southwest Licking Digital

Academy were not used because the Ohio's School Report Cards' Advanced Reports returned no information. In addition to these two schools, if the number of students in a particular category was less than 10, the Ohio's School Report Cards' Advanced Reports returned no information to protect student privacy. This means the “true” answers in this section using unmasked data are slightly different than the results reported. The number of students in the analysis varied by year and is listed in Table 18 below.

Table 18. Number of Student Records

School Year	N
2005-06	18,898
2006-07	19,764
2007-08	22,199
2008-09	25,717
2009-10	27,997
2010-11	31,650
2011-12	34,098
2012-13	39,260
2013-14	40,280

Table 19 shows which e-schools were categorized as dropout recovery schools and which were categorized as non-dropout recovery schools. Table 20 shows which e-schools are categorized as statewide and which are district schools.

Table 19. List of Dropout Recovery and Non-Dropout Recovery E-Schools

Dropout Recovery	Non-Dropout Recovery
Akron Digital Academy	Alternative Education Academy
Auglaize County Educational Academy	Buckeye On-Line School for Success
Cardington Lincoln Local Digital Academy	Electronic Classroom of Tomorrow (ECOT)
Fairborn Digital Academy	Insight School of Ohio
Findlay Digital Academy	Lakewood Digital Academy
Goal Digital Academy	Lorain K-12 Digital Academy
Greater Ohio Virtual	Mosaica Online of Ohio
Mahoning Unlimited Classroom	Ohio Connections Academy
Marion City Digital Academy	Ohio Virtual Academy
Massillon Digital Academy	Provost Academy Ohio
Newark Digital Academy	Southwest Licking Digital Academy
Quaker Digital Academy	Virtual Community School Of Ohio
Treca Digital Academy	West Central Learning Academy II

Table 20. List of Statewide and Non-Statewide E-Schools

Statewide	Non -Statewide
Akron Digital Academy	Auglaize County Educational Academy
Alternative Education Academy	Cardington Lincoln Local Digital Academy
Buckeye On-Line School for Success	Fairborn Digital Academy
Electronic Classroom of Tomorrow (ECOT)	Findlay Digital Academy
Greater Ohio Virtual	Goal Digital Academy
Insight School of Ohio	Lakewood Digital Academy.
Mosaica Online of Ohio	Lorain K-12 Digital Academy
Ohio Connections Academy	Mahoning Unlimited Classroom
Ohio Virtual Academy	Marion City Digital Academy
Provost Academy Ohio	Massillon Digital Academy
Quaker Digital Academy	Newark Digital Academy
Treca Digital Academy	Southwest Licking Digital Academy
Virtual Community School Of Ohio	West Central Learning Academy II

All Other Sections: Data for the other sections came from the Ohio Education Research Center’s (<http://oerc.osu.edu>), longitudinal EMIS database. The longitudinal EMIS database merges each year of Ohio school records into one file that consolidates all data for each student into a single record.

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www.oerc.osu.edu | oerc@oerc.osu.edu | (855) 231-7753

The Ohio State University | John Glenn College of Public Affairs | 1810 College Rd. | Columbus, OH 43210