Section I
Full-Time Virtual and Blended Schools: Enrollment, Student Characteristics, and Performance

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Executive Summary

This seventh NEPC Annual Report on Virtual Education provides a detailed overview and inventory[1] of full-time virtual schools and blended learning, or hybrid, schools. Full-time virtual schools deliver all curriculum and instruction via the Internet and electronic communication, usually asynchronously with students at home and teachers at a remote location. Blended schools combine virtual instruction with traditional face-to-face instruction in classrooms. Evidence related to inputs and outcomes indicates that students in these schools differ from students in traditional public schools. School performance measures for both virtual and blended schools indicate that they are performing poorly. Nevertheless, enrollment growth has continued. Dominant in this sector are for-profit education management organizations (EMOs) that operate exceedingly large virtual schools. School districts

are becoming more active in opening virtual schools, although district-run schools have typically been small, with limited enrollment. This report provides a census of full-time virtual and blended schools. It also includes key findings related to student demographics and state-specific school performance ratings.

Current Scope and Growth of Full-Time Virtual Schools and Blended Learning Schools

- In 2017-18, 501 full-time virtual schools enrolled 297,712 students, and 300 blended schools enrolled 132,960. Enrollments in virtual schools increased by more than 2,000 students between 2016-17 and 2017-18 and enrollments in blended learning schools increased by over 16,000 during this same time period.

- Thirty-nine states had either virtual or blended schools. There were four states that allowed blended schools to operate but still have not allowed the opening of full-time virtual schools. A total of six states have full-time virtual schools but do not currently have full-time blended learning schools.

- Virtual schools operated by for-profit EMOs were more than four times as large as other virtual schools. Virtual schools operated by for-profit EMOs enrolled an average of 1,345 students. In contrast, those operated by nonprofit EMOs enrolled an average of 344 students, and independent virtual schools (not affiliated with an EMO) enrolled an average of 320 students.

- Although private (profit and nonprofit) EMOs operated only 34% of full-time virtual schools, those schools enrolled 64.4% of all virtual school students.

- Just under half of all virtual schools (46.5%) were charter schools, but together they accounted for 79.1% of enrollment. While districts have been increasingly creating their own virtual schools, those tended to enroll far fewer students.

- In the blended sector, nonprofit EMOs operated 32% of schools and for-profit EMOs operated 15.3%. Just over half (52.7%) of blended schools were independent. Blended schools operated by nonprofit EMOs were most numerous although blended schools operated by for-profit EMOs were largest in size (an average of 772 students per school). There were more charter blended schools (62%) than district blended schools (38%), and they had substantially larger average enrollments (529) than district blended schools (303).

Student Demographics

- Virtual schools enrolled substantially fewer minority students and fewer low-income students compared to national public school enrollment.

- The overall proportion of low-income students in blended schools was similar to the national average; however, those operated by nonprofit EMOs enrolled a substantially higher proportion of low-income students than their counterparts. Blended schools had a higher proportion of Hispanic students relative to national enrollments.

- Although special education data was available for relatively few virtual and blended schools, the proportion of special education students in virtual schools with data was higher than the national average, while blended schools with data enrolled slightly fewer children with disabilities relative to the national average.

- Both virtual schools and blended schools enrolled relatively few English language learners (ELLs) compared to the national average.

- While the population in the nation's public schools was split nearly evenly between females and males, virtual schools enrolled more females (53.9%), and blended schools were nearly evenly split.

Student-Teacher Ratio

- The average student-teacher ratio in the nation's public schools was 16 students per teacher. But virtual schools reported having 2.7 times as many students per teacher (44) compared to the national average, and blended schools reported a little more than twice as many (34).
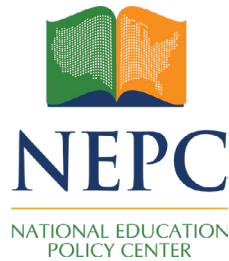
School Performance Data

- Many states continue to have frozen accountability systems or to have implemented new systems that do not include an overall rating. Therefore, overall school performance ratings assigned by state agencies were available for only 21 of the 39 states with virtual and/or blended schools. Overall, a surprisingly low proportion of virtual and blended schools had school performance ratings available: In the states with available school performance ratings, 56% of the virtual schools and 50% of the blended schools had no ratings assigned to them.

- Overall, many virtual and blended schools continue to show low performance ratings, although the proportion of schools with acceptable ratings was higher than reported in the previous year. Of the virtual schools with ratings, 48.5% received acceptable performance ratings. Among the blended schools with ratings, 44.6% received acceptable performance ratings.

- Among virtual schools, far more district-operated schools achieved acceptable school performance ratings (56.7% acceptable) than charter-operated schools (40.8%). More schools without EMO involvement (i.e., independent) performed well (59.3% acceptable ratings), compared with 50% acceptable ratings for schools operated by nonprofit EMOs, and only 29.8% acceptable ratings for schools operated by for-profit EMOs. The pattern among blended learning schools was similar, with highest performance by district schools and lowest performance by the subgroup of schools operated by for-profit EMOs.

On-time graduation rate data were available for 290 full-time virtual schools and 144 blended schools. The graduation rates of 50.1% in virtual schools and 61.5% in blended schools fell far short of the national average of 84%.

Recommendations

Given the overwhelming evidence of poor performance by full-time virtual and blended schools, we include the following recommendation for policymakers.

- Slow or stop the growth in the number of virtual and blended schools and the size of their enrollments until the reasons for their relatively poor performance have been identified and addressed.

- Implement measures that require virtual and blended schools to reduce their student-to-teacher ratios.

- Enforce sanctions for virtual and blended schools that perform inadequately.

- Sponsor research on virtual and blended learning "programs" and classroom innovations within traditional public schools and districts.

Section I

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Over the past seven years, the National Education Policy Center (NEPC) has been active in documenting and researching virtual schooling at the primary and secondary levels.[2] Reports have examined who is enrolling in virtual charter and district schools and how those schools are performing; in addition, reports have focused on a wide range of policy issues specific to virtual schools. While the earliest NEPC reports included only full-time virtual schools, over the past three years, they have included both full-time virtual and full-time blended learning schools.

In the last year, there has been some evidence that the growth in virtual schools is slowing or plateauing. Launching of new virtual and blended schools has slowed, and fewer new virtual and blended schools are meeting our criteria for inclusion in the inventory. Although the growth in the number of schools has slowed, the average size of the schools continues to increase, resulting in net increases in enrollments in both virtual and blended schools. It is striking that growth continues despite overwhelmingly negative evidence relative to virtual and blended school outcomes. As researchers and as educators, we remain optimistic that these new modes of delivery can work, and while research is still limited, we believe they may already be working better as school or district programs rather than as stand-alone schools. We also recognize that there are many teachers across various school types who are innovating and implementing blended learning models that are possibly having far better outcomes than the results from their stand-alone counterparts.

This report contains detailed descriptions of full-time virtual and full-time blended schools operating during the 2017-18 school year. The annual inventory serves as a key research-based

effort to track developments nationwide.[3] This inventory helps detail the schools' student demographics, performance, and rate of growth or attrition. Research questions this report seeks to answer include:

- How many full-time virtual and blended schools operate in the U.S.? How many students do they enroll?

- What are the key organizational characteristics of these schools and who operates them?

- What are the demographic characteristics of students enrolled? How do demographic data for students enrolled in virtual and blended schools differ from those enrolled in brick-and-mortar schools?

- How do virtual and blended schools perform in terms of such school performance measures as state performance ratings and graduation rates?

Student demographics reported here include grade level, ethnicity, sex, socioeconomic status, special education status, and English language learner status. Data on school performance includes a comparison of aggregate performance ratings and national norms when available. We also include data on staffing, specifically on student-teacher ratios.

This report builds on earlier reports; we have updated earlier inventories with available data for the 2017-18 academic year.

Data Sources, Selection Criteria, and Aggregate Calculations

The findings presented in this report are based on publicly available data, collected, audited, and warehoused by public authorities. Data from the National Center for Education Statistics (NCES) was particularly helpful relative to key data on enrollment, student demographics and staffing. Data from state education agencies and from individual school websites provided supplemental data not available from NCES. After collecting data and assembling tables with school descriptors and outcomes, we sent two rounds of email invitations to all virtual and blended schools with available contact emails, inviting them to review the data and information we planned to publish. We are grateful for responses from scores of schools that helped us to correct information and also fill in some of the missing information evident in our tables. Detailed feedback was also provided by K12 Inc. and Connections Education.

The scope of this inventory is limited to full-time, public elementary and secondary virtual and blended schools in the U.S. These include virtual and blended schools operated by for-profit and nonprofit Education Management Organizations (EMOs) as well as virtual schools operated by states or districts. Private virtual or blended schools (funded in whole or in part by charging tuition and fees, rather than relying on a public funding program using tax dollars) are excluded due to absence of relevant data in state or federal data sets. Also excluded are schools offering a combination of programs, including traditional face-to-face programs as well as virtual or blended options, unless it was possible to separate data for the full-time virtual or blended school components.

Schools were identified by the unique school ID code assigned by the NCES or, for relatively new schools, by unique building or school ID codes assigned by state agencies. These criteria helped identify and exclude smaller district programs and schools not intended to be full-time, but simply to offer some virtual learning experience for a subset of students.[4] All schools included had evidence of enrollment in one of the past two years, although schools enrolling fewer than 10 students were excluded. Such restrictions allow for more confidence in attributing various outcomes to specific types of schools.

The primary sources for total enrollment and school performance data were state-level datasets, and school report cards for the 2017-18 school year. Data for grade level enrollment, race-ethnicity and sex were obtained from NCES (the Common Core of Data) and represent the 2016-17 school year, the most recent data available.

In many instances, aggregated data for virtual and blended schools reflect weighted means that have been calculated so that the influence of any given school on the aggregated mean is proportional to its enrollment. Comparisons were made to norms for all public schools in the United States.[5]

Exclusions and Additions Between 2016-17 and 2017-18

For the current study we have included a total of 501 virtual schools and 300 blended learning schools. The process to identify potential schools, review them, and make decisions to include or exclude them was complex and—at times—burdensome.

In the previous year, 376 schools were initially identified as possible virtual or blended learning schools but excluded from the inventory for various reasons. These 376 schools were reassessed this year to determine whether the exclusion remained valid. In 49 cases, schools excluded in 2016-17 because of closure or "program" status were found to be full-time virtual or blended schools enrolling students in 2017-18 and were therefore added to this year's inventory. Of the remainder of the schools that were excluded, 53 were identified with low enrollment (less than 10 students), 100 were confirmed closed or inactive, 44 were confirmed as programs, and 14 were positively identified as alternate names for schools already included. An additional 78 were part-time virtual schools that did not offer diplomas, 15 turned out to be brick-and-mortar schools, seven were schools with virtual and blended programs which could not be disaggregated, and one was a private virtual school and therefore outside this inventory's scope. The 64 remaining schools were either excluded because they were adult programs (to earn a degree), or because they charge tuition.

Of the 728 schools profiled for the 2016-17 school year, 639 were determined to merit inclusion in the 2017-18 inventory. Of those not included, 71 were identified as closed, two were part-time virtual schools, one school was a duplicate of an existing school, and one school was identified as going to open in 2017. In addition, 14 schools were not included because they did not meet enrollment requirements for the study.

In the 2017-18 revision of schools identified in the 2016-17 school search, it was noted that 10 schools had changed their names, and six schools had their virtual/blended status revised

(i.e., they changed management organizations or profit status). Many schools also had their profit status revised since last year; in most cases the schools have changed their relationship with outside for-profit and nonprofit EMOs and are now classified as "independent" since the services they may still receive from their former operator are limited in scope. Input from schools and EMOs improved our ability to accurately identify these important features; adjustments made due to the feedback from these entities notably improved the accuracy of the school inventory.

The school search for the 2017-18 school year yielded an additional 203 schools that had not been identified in prior years. Some of those schools were newly opened, and some were discovered after reviewing virtual tags assigned to schools by the National Center for Education Statistics. All new schools were evaluated for inclusion. After visiting schools' websites, contacting schools' personnel, investigating schools' promotional materials and handbooks, and comparing with state and federal school datasets directories, researchers determined that 111 of the newly identified schools met the standard for inclusion in the 2017-18 inventory. Of the 92 schools which were investigated but not selected for inclusion, 25 were not fully blended schools, 46 did not enroll sufficient students, seven were new schools for the 2018-19 school year, four were school programs, five were closed, three were not tuition-free, and two were private virtual schools and therefore outside this inventory's scope.

Out of the 111 schools identified as new to the dataset for 2017-18, 28.8% (32) were blended schools, while 71.2% (79) were virtual. Researchers searched all state department of education websites for schools not previously included in the inventory. Those schools were then directly contacted by phone, and designated personnel were asked to confirm the school status and verify all school data. New blended schools were further identified by examining school promotional materials and handbooks, by using external resources (for example, the Christensen Institute and the blended universe website), and by gathering input from schools and EMOs. The identification of blended schools was more challenging than that of virtual schools because many virtual schools clearly display their status and their unique curriculum delivery approaches on their websites. In addition, many states provide comprehensive lists of virtual schools operating in the state. While refinements to the identification of blended schools resulted in a notable increase in blended schools included in the dataset, it remains likely that there are blended schools that this inventory has missed.

Limitations

There are several general limitations that readers should keep in mind. Most of these limitations are experienced by other researchers in this area, although they are not always highlighted in reports.

Incomplete demographic, class size, and performance data. The tables and records in our inventory have several gaps that reflect missing data. Some states combine virtual school data with local district data in ways that make disaggregation impossible. For example, while data on student ethnic background and free and reduced-price lunch status is relatively complete, data reported at the district level (including, for example, special education

enrollment) is often unavailable. This was particularly problematic in states where charter schools are not considered Local Education Authorities or districts.[6]

Comparison groups. National aggregate results for all public schools provided the base for several comparisons in this report, which profiles 39 states having virtual and/or blended options.[7] While comparisons of two inherently different forms of schooling, each representing different geographic datasets, have some obvious weaknesses, national aggregate data is what state and federal agencies typically use in their reports and comparisons. Following the agencies' lead is intended to allow reasonable comparison of this report with others. An additional consideration is that, because the 39 states represented are among the largest and most densely populated, the national comparison is informative, if not perfect. It is perhaps also worth noting that the national data include data for full-time virtual and blended schools, although it constitutes a relatively small subset of the data used for this study.

Instability in virtual and blended schools. Full-time virtual and blended schools are rapidly evolving; the number of such schools, their demographic composition, and their current performance data could vary from the 2016-17 demographic data and the 2017-18 performance data presented here (the most recent available for each category). When the fluidity of the terrain is layered onto the scope of this attempt to compose a national portrait, some errors of inclusion and exclusion seem likely. Documented corrections to the data are welcome and can be submitted to the authors through the National Education Policy Center.

Growth and Current Scope of Full-Time Virtual and Blended Schools

Virtual Schools

An array of education services is delivered online. On one end of the continuum, individual courses are delivered to students who are otherwise enrolled in brick-and-mortar schools. The middle terrain includes a wide array of blended programs and schools serving students with a combination of face-to-face and online activities. On the other end of the continuum, full-time virtual schools provide all instruction online.

For the purposes of this report, blended schools are defined as schools in which all students experience the same blended instruction. There are variations across schools in how they combine virtual and face-to-face activities. Full-time virtual and blended schools are especially important to track because they receive full funding for delivering what is supposed to be a full school experience.

Although these schools still account for a relatively small portion of the overall school choice options in the U.S., they constitute some of the fastest-growing options. Virtual schools overlap with two other choice options: homeschooling and charter schools. Some students in virtual schools use this experience to supplement their homeschool experience. Further, 79 percent of virtual school student are enrolled in virtual charter schools, so these students can be counted as both virtual school students and charter school students. Appendix A

contains charts that depict the number of virtual and blended schools and students by state. During the 2017-18 school year, there were 29 states with both full-time virtual schools and full-time blended learning schools. While legislation for full-time virtual schools usually precedes legislation for full-time blended learning schools, there were four states that allowed blended schools to operate but still have not allowed the opening of full-time virtual schools: Hawaii, Illinois, New Jersey, and Rhode Island. A total of six states have full-time virtual schools although they still do not have full-time blended learning schools.[8] Note that three states (Connecticut, Missouri, and Wyoming) that had either a blended or virtual school included in earlier inventories had no schools included in this report, either because the schools were closed, reclassified as programs, or had too few students to be included in the inventory.

Beyond the 39 states with either virtual or blended schools, we recognize that other states also offer virtual education options, but in several other formats including, for example, the offering of individual online classes for some students or supplemental coursework facilitated online. It is important to note that this report tracks only full-time virtual and blended schools; outside the scope of this study are programs within districts and brick-and-mortar schools as well as other online offerings such as the delivery of individual online courses.

A total of 501 full-time virtual schools met the selection criteria for the 2017-18 school year.[9] These schools enrolled 297,712 students, indicating a net growth of just over 2,000 students over the past year. This represents a growth rate of just over 0.5%, which is the slowest growth recorded in this sector (see Figure 1).

A total of 300 blended schools met the selection criteria in 2017-18. These schools enrolled 132,960 students. While the number of blended learning schools meeting our criteria increased by only four schools, the net enrollment increased by just over 16,000 students.

Figure 1 illustrates the estimated enrollment growth in full-time virtual schools over the last 17 years.[10] Figure 1 also illustrates the proportion of students in full-time virtual schools operated by the two largest for-profit EMOs, K12 Inc. and Connections Academy. K12 Inc. schools accounted for 29.7% of all virtual school enrollments, a slight decrease from the prior year. It may be worth noting that K12 Inc.'s enrollment numbers were boosted in 2017-18 by the closure of a school (Electronic Classroom of Tomorrow—ECOT) in Ohio. ECOT and its for-profit operator (Altair Learning Management LLC) were mired in scandals and forced to close in January 2018. A large portion of the close to 14,000 students in this school shifted over to the Ohio Virtual Academy operated by K12 Inc. This boosted enrollment at this school to more than 20,000 students by the end of the school year. Connections Academy schools accounted for 18.7% of all enrollments. Overall, the market share of these two large companies dropped from their peak of 59.5% in 2015-16 to 48.4% in 2017-18.

As noted earlier, some of the changes we are seeing in this sector result from some schools shifting their relationship with these companies from "operators" (Education Management Organizations or EMOs) to vendors. A vendor relationship involves the school hiring outside companies or organizations to provide specific services or products, primarily access to the learning platform and curriculum provided by these EMOs.

Figure 1. Enrollment Trends in Full-Time Virtual Schools
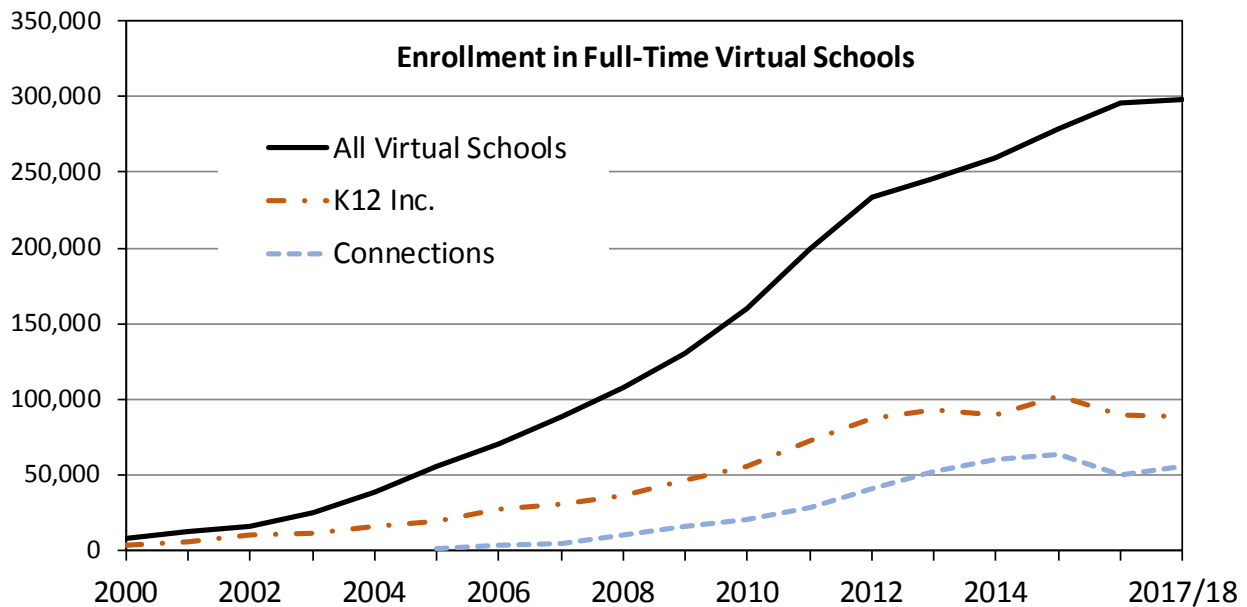
New district-operated schools continue to add to the pool of full-time virtual schools, although they still tend to be small relative to virtual charter schools (see Table 1). While the proportion of district operated virtual schools increased by 1.1 percentage points between 2016-17 and 2017-18, the proportion of total enrollments in district run schools dropped by 3.4 percentage points.

There were 268 district virtual schools and 233 charter virtual schools in 2017-18. Between 2016-17 and 2017-18, there was an increase of 43 district and 29 charter schools. Interestingly, while the number of district schools increased more, net enrollment in these schools dropped by more than 10,000 students, while the charter schools increased their enrollments by more than 12,000 students. The districts now account for just over half of the total number of virtual schools, but their share of enrollments is only 20.9%, while the charter schools account for 79.1% of all students enrolled in virtual schools. While the district virtual schools are decreasing in average school size, the virtual charter schools have experienced growth in the average number of students per school (average of 1,011 students per virtual charter school). Contrast this with an average of 232 students per school in district-operated virtual schools. A possible explanation for this is that district schools are created to serve smaller targeted populations within district boundaries, while charter virtual schools are more likely to target statewide markets. Another possible explanation is that district virtual schools are seldom operated by for-profit companies that have larger school sizes designed for larger profit margins.

Table 1. Distribution of Virtual Schools and Students Across District and Charter Sectors, 2017-18

	Total Number of Schools in 2017-18	Percent of All Schools	Students	Percent of All Enrollment	Average Enrollment Per School
District	268	53.5%	62,169	20.9%	232
Charter	233	46.5%	235,543	79.1%	1,011
Total for All Virtual Schools	501	100.0%	297,712	100.0%	594

Private education management organizations (EMOs) operated 34% of all full-time virtual schools, accounting for 64.4% of enrollment. Both the nonprofit-EMOs and the for-profit EMOs have gained a little market share over the past year, while the total enrollments in "independent" virtual schools lost ground. Note that we use "independent" to refer to virtual schools that do not have a private EMO owner or operator. Both charter virtual schools and district virtual schools can be considered "independent" if they are not operated by a private company or organization.

Within the virtual school sector, private for-profit EMOs continue to play a prominent role. They operated 26.5% of all virtual schools, which together enrolled 60.1% of the student population (see Table 2). Generally, charter virtual schools were much more likely than district virtual schools to be operated by a for-profit EMO. Nonetheless, a total of 32 district virtual schools were operated by for-profit EMOs (primarily K12 Inc.).

K12 Inc. remains the largest EMO in this sector; in 2017-18, it operated 73 full-time virtual schools enrolling 88,329 students. Still, in the past year it continued a pattern with decreasing total numbers of schools, and a leveling off in the number of students enrolled. Connections Academy, the second largest for-profit EMO, operated 36 virtual schools enrolling 55,701 students, an increase of just over 5,000 students between 2016-17 and 2017-18. Connections saw a net decrease of two schools, so this growth is due to increasing school size.

It is important to note that this report's data on these private operators likely under-represents the role of for-profit EMOs. In addition to operating some schools as an EMO, K12 Inc. and Connections also had a vendor relationship with scores of others. When an EMO operates a school, it has executive control of the school, including curriculum and programs, as well as hiring of administrators and teachers. In vendor relationships, the private company typically leases to the school its learning platform and curriculum, while the school directly manages all other aspects of the school, including directly hiring teachers and administrators.

Nonprofit EMOs operated only 37 virtual schools in 2017-18 and increased enrollments from 7,319 students in 2016-17 to 12,745 in 2017-18. The largest of the nonprofit EMOs are Learning Matters Educational Group (six schools), Idaho Virtual Academy Inc., (five schools), SIA

Tech (three schools), and Compass Charter schools (three schools).

Aside from K12 Inc. and Connections Academy, a number of other for-profit EMOs have entered the marketplace. These included Calvert Education Services (six schools), Edison Learning (two schools) and Cyber Education Center (two schools). Mosaica Education Inc. and White Hat Management had already entered this marketplace, but in the last few years they lost contracts for schools or sold schools to other EMOs. During the 2016-17 school year, they operated two virtual schools each. Many of the White Hat schools were sold to Accel Schools during and after that school year. Given the relatively lucrative circumstances[11] under which full-time virtual schools can operate, it is likely that still more for-profit EMOs will expand their business models to include full-time virtual schools.

Independent virtual schools also showed growth in the last two years, with an addition of 56 schools, although in terms of enrollments there was a net decrease of just around 7,000 students. Independent virtual schools averaged 320 students, nonprofit EMO-operated schools averaged 344 students, and—in stark contrast—for-profit EMO-operated schools averaged 1,345 students. Variance in the for-profit sector's enrollments is great, with some for-profit EMOs operating schools with more than 10,000 students and one that enrolls more than 20,000 students in a single school unit.

Table 2. Distribution of Virtual Schools and Students by Operator Status, 2017-18

	Number of Virtual Schools	Percent of All Schools	Number of Students	Percent of All Enrollment	Average Enrollment Per School
Independent	331	66.1%	106,033	35.6%	320
Nonprofit EMO	37	7.4%	12,745	4.3%	344
For-profit EMO*	133	26.5%	178,934	60.1%	1,345
All Virtual Schools	501	100.0%	297,712	100%	594

*Note: K12 Inc. has 73 for-profit schools, enrolling 88,329 students. This accounts for 14.6% of all virtual schools and 29.7% of all enrolled students, with an average of 1,210 students per school.

Connections has 36 for-profit schools, enrolling 55,701 students. This accounts for 7.2% of all schools and 18.7% of all students, with an average of 1,547 students per school.

Blended Schools

There were 300 blended learning schools that met our selection criteria for 2017-18; these schools enrolled 132,960 students. As Figure 2 shows, enrollments in blended schools have

grown sharply in the last few years. The growth is both due to new schools and an increase in average school size in schools operated by the EMOs. The pronounced jump in the number of blended learning schools between 2015-16 and 2016-17 was due to a large number of new schools opening as well as changes in our data collection methods, which helped us identify more schools that were previously under the radar of our annual inventory. Among larger EMOs operating in this sector, K12 Inc. is the largest for-profit operator and Rocketship Education the largest nonprofit operator.

Figure 2. Enrollment Trends in Full-Time Blended Schools
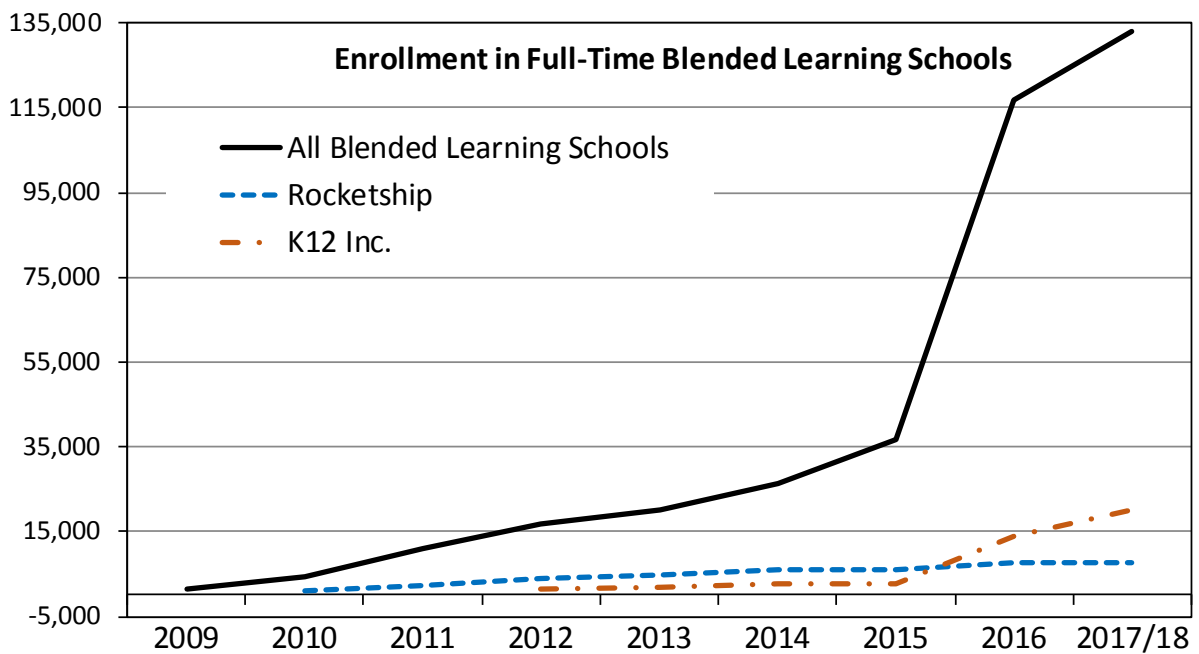
Between 2016-17 and 2017-18, we saw the number of blended charter schools decrease slightly and the number of district-operated blended schools increase. While the net number of blended schools meeting our inclusion criteria increased by only four schools, the net enrollments increased by more than 16,000 students. The average enrollments in both district and charter-operated blended learning schools increased substantially (across all blended learning schools, the average school enrollment was 394 in 2016-17 and this increased to 443 students per schools in 2017-18 [see Table 3]).

Table 3. Distribution of Blended Schools and Students Across District and Charter Sectors, 2017-18

	Total Number of Schools 2017-18	Percent of All Blended Schools	Students	Percent of All Enrollment	Average Enrollment Per School
District	114	38.0%	34,522	26.0%	303
Charter	186	62.0%	98,438	74.0%	529
Total for All Blended Schools	300	100.0%	132,960	100.0%	443

There were 114 district-operated blended schools in 2017-18 compared to 186 charter-operated blended schools. Enrollments in the charters are substantially larger (529 students per school) compared to those in district schools (303 students per school). While the charter blended schools account for 62% of all blended schools, their much larger size resulted in them accounting for 74% of all enrollment in blended schools.

Most blended learning schools are independent district-operated schools with smaller enrollments than those managed by private EMOs (see Table 4). Independents had an average of 363 students per school, while nonprofit EMO schools averaged 417 students and for-profit EMO schools averaged 772 students.

Table 4. Distribution of Blended Schools and Students by Operator Status, 2017-18

	Number of Blended Schools	Percent of All Schools	Number of Students	Percent of All Enrollment	Average Enrollment Per School
Independent	158	52.7%	57,403	43.2%	363
Nonprofit EMO	96	32.0%	40,051	30.1%	417
For-profit EMO	46	15.3%	35,506	26.7%	772
All Blended Schools	300	100.0%	132,960	100%	443

EMOs are largely responsible for enrollment growth in full-time blended learning. As in the virtual school sector, the most involved for-profit EMOs is K12 Inc. (eleven schools enrolling 20,200 students). Connections Academy has also been extensively engaged with blended learning schools and earlier referred to their schools with the Nexus name. Over the last two years, however, Connections has realigned their work in this sector allowing most schools to select more limited services and supports. For this reason, most of the blended schools affiliated with Connections now have a vendor relationship rather than an EMO relation-

ship. Connections is a subsidiary of Pearson Education and the reorganization of the school services now falls within the subsidiary referred to as Pearson Online and Blended Learning Services.

White Hat Management operated 13 blended schools in 2016-17, but most have now been sold to Accel Schools (led by K12 Inc.'s former CEO). Other for-profits operating in this sector include Success VLC (ten schools), Opportunities for Learning Public Charter Schools (five schools), Calvert Education Services (four schools), and Edtec central LLC (three schools).

Nonprofit EMOs, however, are much more prevalent in the blended sector than their for-profit counterparts. The two biggest nonprofit EMOs in the blended school sector are Rocketship Education and Alliance College-Ready Public Schools (both operate 15 schools). Other nonprofits in this sector include Summit Public Schools (11 schools), SIATech (seven), FirstLine Schools Inc. (five), Phalen Leadership Academies (four), Roads Education Organization (three), Pathways Management Group (three), Cornerstone Charter Schools (three), Education for Change Public Schools (three), and Method Schools (three).

Student Characteristics

The following analysis of student demographics provides context for school performance data comparisons discussed later.

Race-Ethnicity

Data on demographics is from the National Center for Education Statistics; the most recent year with NCES demographic data was 2016-17. We relied on this federal source because data available from state sources for 2017-18 was less complete than what was available at the national level.[12]

The proportion of minority students in virtual schools had slowly increased a few percentage points leading up to our reference year of 2016-17. Over the past two years, however, the numbers remained largely unchanged except for a three-percentage-point drop in the proportion of Black students. Aggregate data on student ethnicity from virtual schools continues to differ substantially from national averages.[13] Nearly 65% of the students in virtual schools were White-Non-Hispanic while the national mean was 49.8% (see Figure 3). Not surprisingly, then, the proportion of Black and Hispanic students in virtual schools was noticeably lower than the national average. Only 12.1% of students in virtual schools were Black while the national average was 25.5%; 14.1% of students in virtual schools were Hispanic while the national average was 15.5%.[14]

Figure 3. Race/Ethnicity of Students in Virtual Schools Compared with National Averages, 2016-17

Race/Ethnicity of Students, 2016-17
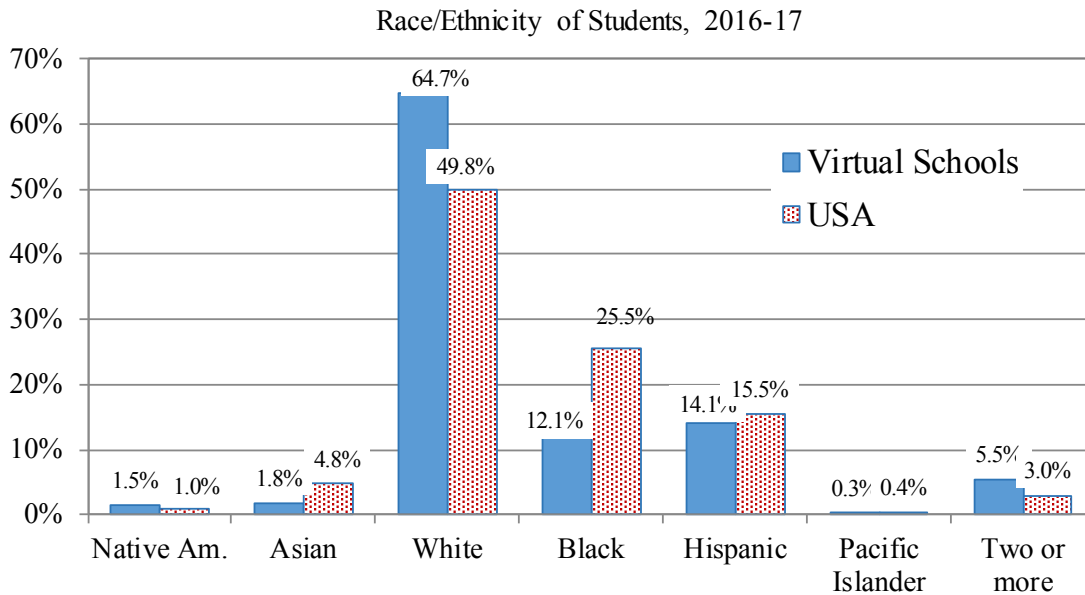
The fact that minority low-income families may have less access to technology may help explain underrepresentation of these groups, even though many of the virtual schools loan their students computers and often pay for internet access. There are other possible explanations for the over-representation of White students in these schools, such as White flight by urban families or the fact that virtual schools often present the only viable form of school choice in rural areas where minority students make up smaller portions of the school enrollment population. A recent study in Ohio found that students and families appear to self-segregate with low-income, lower achieving White students more likely to choose e-schools while low-income, lower achieving minority students more likely to choose brick- and-mortar charter schools.[15] These possible explanations warrant further exploration to determine whether they can explain underrepresentation of some ethnic groups in virtual schools.

Figure 4 displays demographics of students enrolled in blended schools. Relative to the student population of virtual schools, the blended school student population better matched national averages. One noteworthy difference is that Hispanic enrollment in blended schools is substantially higher than in traditional public schools. This finding may be explained by the fact that blended learning schools are concentrated in California and Colorado—states with larger concentrations of Hispanic students. As blended schools expand in other states, it is likely that the overall proportion of Hispanic enrollments will more closely resemble the national average.

It is interesting to note that, with the sharp expansion of blended schools in the past three years, the proportion of Black students increased by five percentage points while the proportion of white students dropped by close to seven percentage points.

Figure 4. Race/Ethnicity of Students in Blended Schools Compared with National Averages, 2016-17

Race/Ethnicity of Students, 2016-17
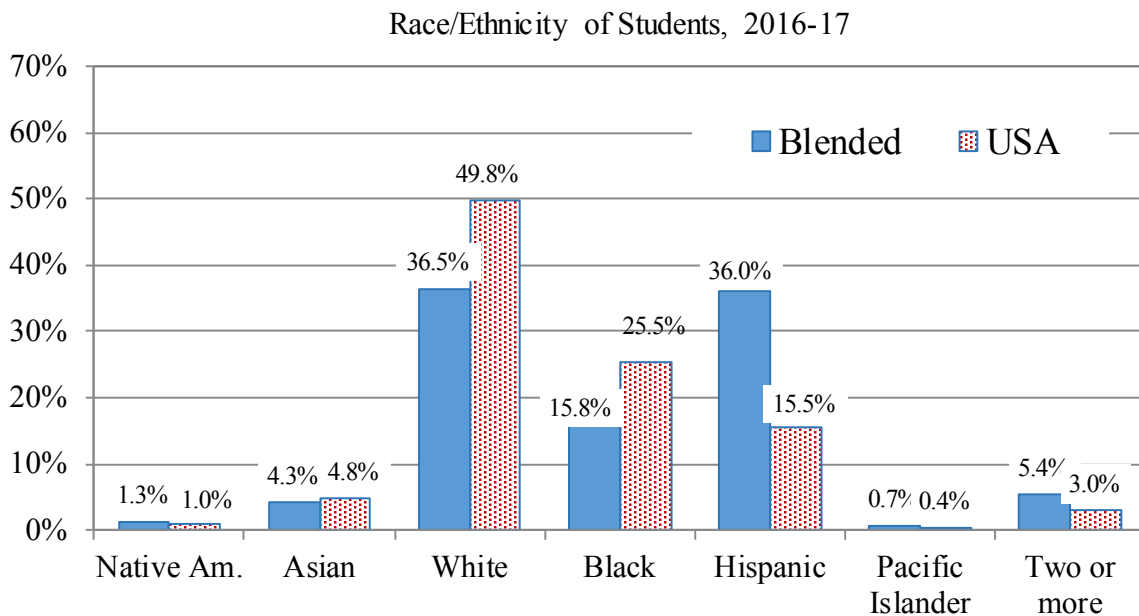
Virtual and blended schools operated by charter schools had slightly more minority students than district-operated virtual and blended schools. The virtual and blended schools operated by nonprofit EMOs served slightly more minority students than the schools operated by for-profit EMOs and schools classified as independent.

Free and Reduced-Price Lunch

As illustrated in Figure 5, in 2016-17 the proportion of students in full-time virtual schools with available data (480 schools) who qualified for free or reduced-price lunch (FRL) was 31.5%—20 percentage points lower than the national average of 51.3%. Within the virtual school sector, district schools had slightly lower proportion of low-income students (25.6%) than charters (33%), while for-profits had a slightly higher percentage (36.5%), and nonprofits had the greatest percentage (40.6%).

Blended schools with available data (280 schools) enrolled a much higher proportion of FRL students than virtual schools. In 2016-17, 50.6% of the students enrolled in blended schools qualified for free or reduced-priced lunch; just under the national average. For-profit blended schools enrolled 51.7% low-income students, independents enrolled 41.8%, and nonprofits enrolled a substantially larger 63.8%. The difference in this area is noticeable, and it may point to a genuine desire on the part of nonprofit schools to provide better learning opportunities to economically disadvantaged students.

Figure 5. Students Qualifying for Free and Reduced-Priced Lunch, 2016-17
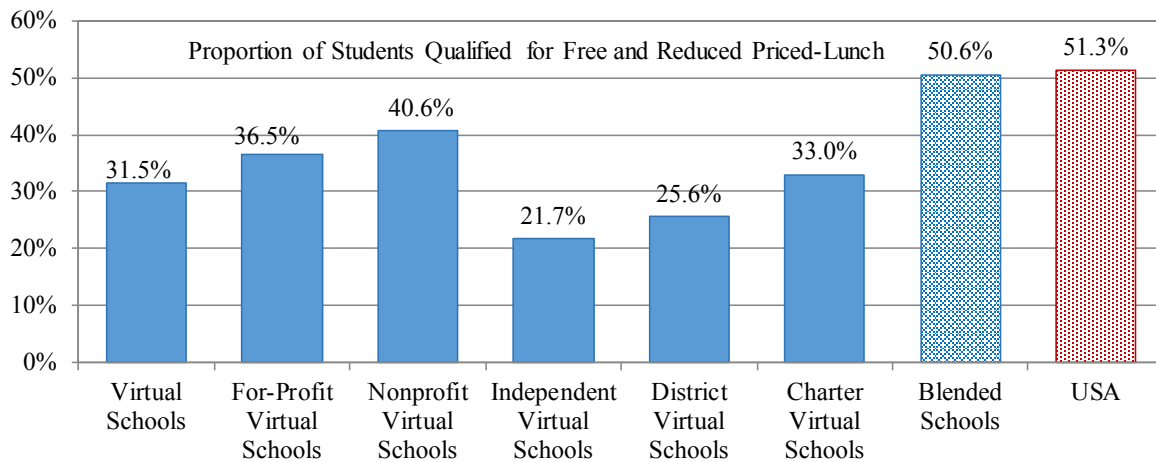
Special Education and English Language Learner Status

As illustrated in Figure 6, the proportion of special education students attending full-time virtual (15.5%) exceeds the national average of 13.1%. Students in this population have an identified disability and an Individualized Education Plan (IEP) on record. The proportion of students with disabilities in virtual schools has grown rapidly—from 6.8% in 2010-11 to 13% in 2015-16 and then 15.5% in 2016-17. The proportion of students with special education needs in the blended learning was 12.1% in 2016-17 which was a slightly lower than the proportion in the previous year.

Our source of data for special education comes from the NCES. It is important to note that data was available for only 74 of the virtual schools and 40 blended learning schools. The overwhelming number of schools were excluded because they had no data or because the data reported for the schools was actually for the larger district in which the school resided.

Given that the weighted average we obtained is for only a portion of the schools, the actual proportion of students with disabilities may be much lower. (It is unlikely that the proportion would be higher since there is a strong financial incentive to report this data: categorical funding designated for special education students would noticeably increase revenues.)

Although virtual schools and—to a lesser extent—blended schools appear to be enrolling a significant proportion of students with disabilities, it is not possible to determine the relative proportions of students with mild, moderate and severe disabilities, making a comparison with traditional public schools impossible. However, there is reason to believe that the populations likely differ substantially: Past research has established that traditional public schools typically have a higher proportion of students with moderate or severe disabilities, while charter schools are more likely to have students with mild disabilities that are less costly to remediate or accommodate.[16]

The overall proportion of students with IEPs in virtual and blended learning schools indicates that these schools are becoming more attractive for children with disabilities relative

to brick-and-mortar charter schools. Another possible explanation may be that these schools are labeling these children at a higher rate after they arrive. It may also be the case that the private companies operating many of these virtual schools are marketing to this population because of the additional federal and state funding that follows them.[17]

Aside from anecdotal evidence from special education teachers who have contacted us, little is known about how virtual schools deliver special education services online. A study from 2012[18] did indicate that while K12 Inc. had a higher proportion of children with disabilities relative to brick-and-mortar charter schools at that time, they were spending a fraction of what charter schools spend for special education teachers' salaries and benefits. This suggests that additional revenues for students with disabilities were not translating into increased spending on special education.[19]

Figure 6. Proportion of Students Classified as Special Education, or Classified as English Language Learners, 2016-17
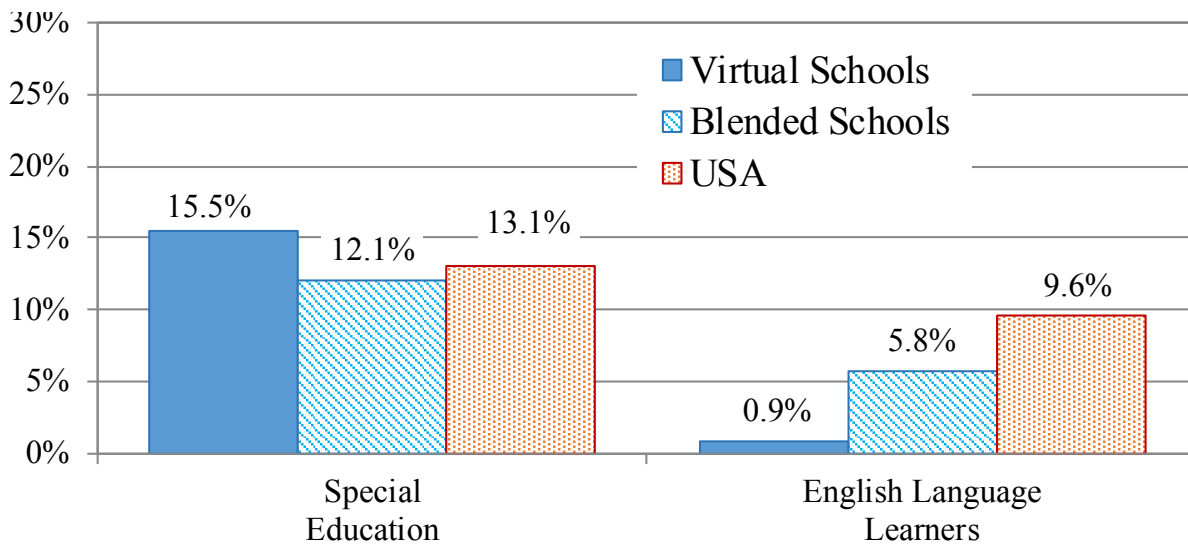
English language learners (ELLs) represent a growing proportion of students in the nation's schools, especially in the states served by virtual and blended schools. Of the 46 full-time virtual schools with available data, only 0.9% of students were classified as ELL. Available data from 21 blended learning schools indicated that English language learners accounted for 5.8% of the student population. The exceptionally low proportion of ELL students in full-time virtual schools is a striking difference from the 9.2% national average[20] (see Figure 6).

Sex

While the population in the nation's public schools is nearly evenly split between females and males, the 2016-17 student population enrolled in both virtual schools (382 schools with data) and blended schools (235 schools with data) was skewed in favor of females (53.9% female) in virtual schools, and nearly even in blended schools (50.1% female). These ratios remained largely the same for charter, independent and for-profit schools. In district virtual schools, the proportion of females was slightly higher at 54.3%.

When sex relative to a school's grade levels was considered, some interesting patterns emerged. Virtual schools serving primary and middle school students tended to have a more balanced mix of females and males, whereas schools that served only grades 9-12 tended to have more female students enrolled. Several plausible explanations include that high schools may emphasize the needs of teen mothers, or that struggling males may be more likely to drop out of school entirely, whereas females may more often persist in an alternative format like a virtual school. More research on this area is needed. For blended schools, the ratio remained relatively balanced at all levels.

Enrollment by Grade Level

The National Center for Education Statistics (NCES) uses four school-level classifications: elementary, middle school, high school, or other. "Other" refers to grade configurations that cut across the other three levels. Sixty-three percent of virtual schools fell into the "Other" category because they were designed or intended to enroll students across two or more levels; in fact, many served students from kindergarten to Grade 12. A total of 10.7% were designated as primary schools, 2.8% as middle schools, and 23.8% as high schools. The figures for blended learning schools indicated that 33.1% were classified as Other, while 17.8% were elementary schools, 7.0% were middle schools, and 42.1% were high schools. While these classifications are generally useful for describing traditional public schools, they are less useful for describing student distribution in charter schools, which comprise a large segment of virtual and blended schools. Charters often have permission to serve all grades but may actually enroll students in a more limited grade range.

To illustrate the distribution of students in virtual schools as accurately as possible, Figure 7 details NCES data on actual student enrollment by grade for 2016-17; comparisons were based on national averages. A disproportionate number of students in virtual schools were in high school or upper secondary level, in contrast to the national picture where a relatively stable cohort of students was generally distributed evenly across grades, with a gradual drop from grades 9 to 12. This finding is interesting because brick-and-mortar charter schools were more likely to concentrate on the primary and lower secondary levels, which have lower per-pupil costs than the upper secondary level.

District-operated virtual schools served more students at the upper-secondary level than charter schools did. Nonprofit EMO-operated schools and independent schools both served many upper secondary students, unlike for-profit EMO schools. The for-profits, predominately by K12 Inc. and Connections Academy, not only served substantially fewer students at the upper secondary level but also showed stark enrollment drops after Grade 9.

Virtual schools operated by for-profit EMOs typically see steep declines after Grade 9, while many district-operated schools serve only students in the final few grades of high school, offsetting the decline in for-profit EMOs. This surprising decline in the grade cohorts in the for-profit EMO schools may be related to the low graduation rates of virtual schools: If dropout rates are high, then a portion of students do not persist into the upper grades.

Figure 7. Enrollment by Grade Level for Virtual Schools and U.S., 2016-17

Distribution of Enrollment by Grade in Virtual Schools
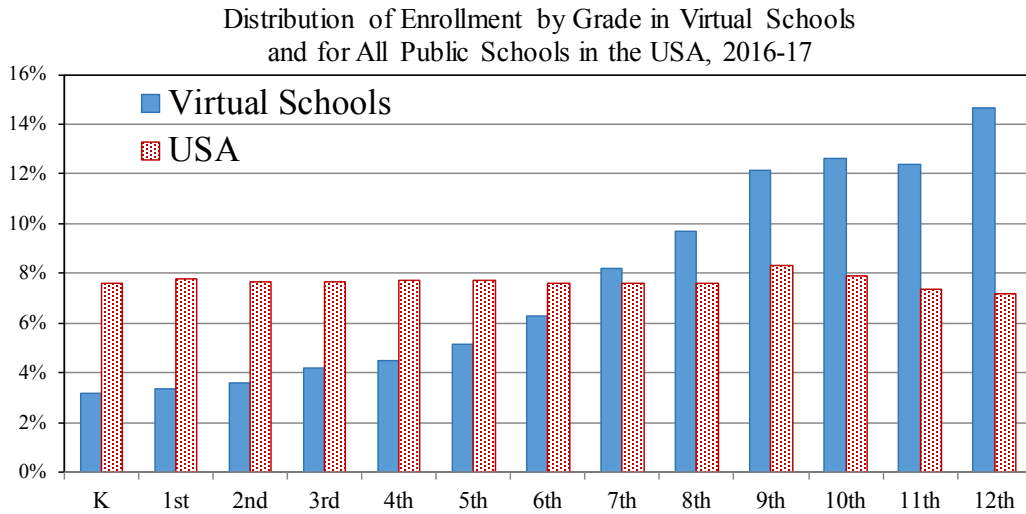and for All Public Schools in the USA, 2016-17

Figure 8 illustrates grade-level student distribution in blended schools. Blended schools have high concentrations of students at the high school level and fewer students at the elementary and middle school levels. The large concentration of students at Grade 12 may be due to students using blended schools for credit recovery or as an alternative for late graduation. Given that students at the upper secondary level are likely to be more technologically savvy, and given that more mature students are better able to self-regulate and work independently, it makes sense to see concentrations of students and blended schools in those grades. High schools may also have greater expertise and interest in blending learning.

Figure 8. Enrollment by Grade Level for Blended Schools and U.S., 2016-17

Distribution of Enrollment by Grade in Blended Schools
and for All Public Schools in the USA, 2016-17
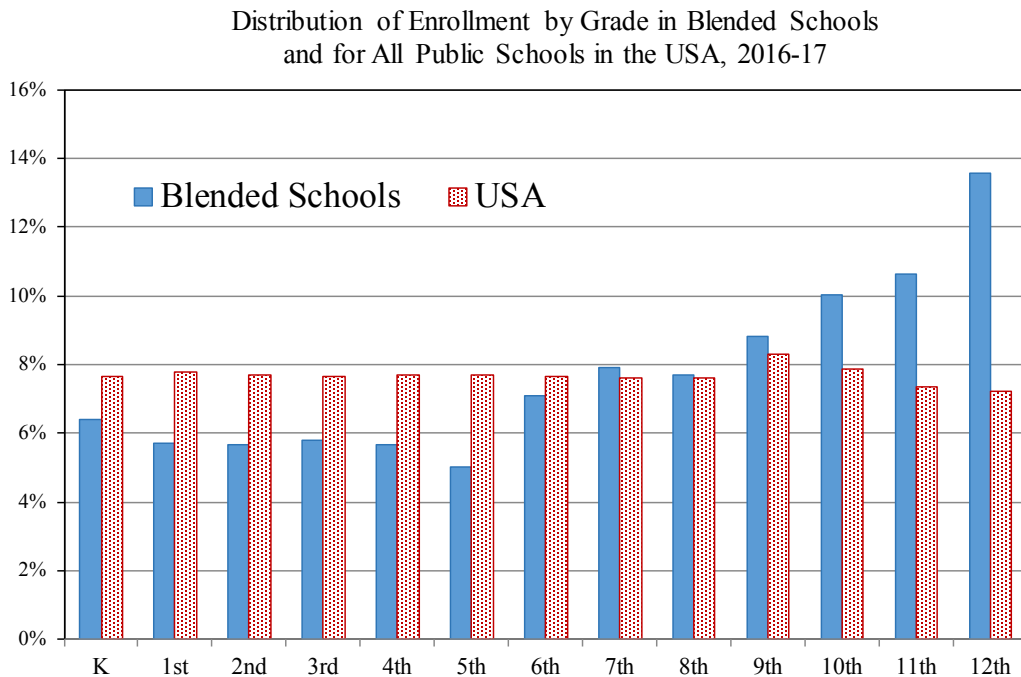
Student-Teacher Ratios

Far more schools reported demographic data for their students than reported student-teacher ratios. Due to a relative dearth of information on student-teacher ratio from state education agencies and from school report cards, the most recent and complete data available was NCES Common Core data for school year 2016-17.

While student-teacher ratio (S/T) was not provided as a calculated statistic in the NCES School Universe Survey data, enrollments and full-time equivalent teachers were made available. Therefore, for this report S/T was calculated as the number of students reported to the NCES for the 16-17 school year divided by the number of full-time equivalent teachers reported for the same year.

Group mean student-teacher ratios were calculated using 2016-17 enrollment as a weight. Weighting S/T ratios by total enrollment results in a mean ratio that represents the average class size that students experienced rather than the average class size that schools provided.

Table 5 contains key indicators related to student-teacher ratios in full-time virtual schools. While the average ratio was approximately 16 students per teacher in the nation's public schools, virtual schools reported nearly three times as many students per teacher (43.8). The district virtual schools had similar student-teacher ratios (44.6) to the charter virtual schools (43.7).

Among virtual schools, those operated by nonprofit EMOs had a substantially higher average student-teacher ratio (71.7). Note that among nonprofit EMO schools, a small number had an excessively high student-teacher ratio that inflated this mean score. Virtual schools operated by for-profit EMOs and independent virtual schools both had student-to-teacher ratios of 42.6.

Table 5. Student-Teacher Ratios in Virtual Schools, 2016-17

	Number of Schools with Data	Weighted Mean	SD	Min	Max
All Virtual Schools	355	43.9	81.9	0.0	1290.0
Independent Virtual	232	42.7	48.1	0.0	466.0
Nonprofit Virtual	20	71.7	283.8	13.7	1290.0
For-Profit Virtual	103	42.6	47.9	1.4	368.9
District Virtual	168	44.6	50.3	0.3	466.0
Charter Virtual	187	43.7	102.4	0.0	1290.0
National Average[21]		16.0[22]			

This number is heavily affected by unexpected outliers that reported substantially different numbers in the previous year. The data revealed considerable outliers, with some virtual schools reporting less than 1 student per teacher[23] and others reporting more than 700.

Table 6 includes blended school data by EMO, district and charter status. On average, the blended learning schools have surprisingly large student to teacher ratios (33.9 students per teacher)—lower than full-time virtual schools, but still more than twice as large as the national average. District blended schools reported 36.3 students per teacher, which was higher than the 30.5 students in charter blended schools.

Interestingly, independent and district blended schools had exceedingly high student-teacher ratios with 43.8 students per teacher and 51.8 students per teacher, respectively. Blended schools operated by nonprofit EMOs reported 25.8 students, and those blended schools operated by for-profit EMOs reported 23.3 students.

Table 6 includes virtual school data by EMO, district and charter status. On average, the blended learning schools have surprisingly large student to teacher ratios (31.7 students per teacher)—lower than full-time virtual schools, but still twice as large as the national average. District blended schools reported 36.3 students per teacher, which was higher than the 30.5 students in charter blended schools.

Interestingly, independent blended schools had the highest student to teacher ratios with 37.5 students per teacher. Blended schools operated by nonprofit EMOs reported 30 students, and those blended schools operated by for-profit EMOs reported 23 students. Table 6 also contains results for the three largest EMOs operating blended learning schools. The nonprofit EMO Rocketship had 35 students, while the for-profits K12 Inc. had 25.6 and Connections had 12.

Table 6. Student-Teacher Ratios in Blended Learning Schools, 2016-17

	Number of Schools with Data	Weighted Mean	SD	Min	Max
All Blended Schools	260	33.9	26.5	0.0	237.5
Independent Blended	145	43.8	32.6	1.8	237.5
Nonprofit Blended	75	25.8	10.6	0.0	60.4
For-Profit Blended	40	23.3	21.8	8.5	96.9
District Blended	104	51.8	32.3	3.8	237.5
Charter Blended	156	26.3	21.6	0.0	230.0
National Average		16.0			

School Performance Data

This section reviews overall school report card ratings and on-time graduation rates. General findings and trends are presented and discussed here, and findings by state appear in Appendix B.

The first decade of the new millennium provided little research into full-time virtual and blended school student achievement at the K-12 level, and results of existing research were not positive. A review of early evidence on the performance of virtual schools can be found in Miron and Urschell (2012[24]) and in last year's inventory of virtual and blended learning schools (Miron, Shank, and Davidson, 2018[25]). Additional evidence relative to the performance of virtual and blended learning schools can also be found in the second section of this report, Michael K. Barbour's *What Virtual and Blended Education Research Reveals*. The body of evidence is overwhelming in its critical conclusion that virtual schools are performing terribly with no signs of improvement. Aside from self-reported or self-funded evidence, the blended learning schools are only performing slightly better than the full-time virtual schools.

This overview of literature on the performance of virtual and blended learning schools reveals that most attention has been given to virtual schools. Now that blended learning schools are increasing in numbers and size, we can expect more evaluations and research in this area.

Methodology

In order to determine whether schools were performing acceptably or not, we looked at School Performance Ratings assigned by the state education agencies. These were typically found on school report cards. In some of our earlier reports on virtual schools, we also examined mean performance on state assessments. We chose to focus on school report cards this year because they provide a more holistic picture of a school's performance. A second and more compelling reason is that over the past two years, many states introduced new tests aligned with college- and career-ready standards, while others changed their cut scores or expectations for "proficiency," or they adopted a new scoring scale. When states took these actions, test results were no longer comparable over time. Moreover, some states now report limited or no school performance data from state assessments.

This year's performance data is limited by the availability of report cards for schools and districts. As a result of the changing and currently incomplete database, variations in school performance between this year and last year should be interpreted cautiously.

For several reasons, there are many gaps in report card ratings. Due to current flux in accountability systems resulting from new requirements under the Every Student Succeeds Act (ESSA) and flexibility waivers and extensions granted under the Elementary and Secondary Education Act (ESEA), many states have put their accountability systems on hold as they finalize new formats and transition to new standards and state tests. Several additional states do offer some school report card data but are not currently assigning an overall performance rating, and several more states do not have any current school report card data available and offer no explanation as to why. Finally, Wyoming does not count virtual schools as separate entities and assigns the students who attend these schools to the brick-and-mortar building that they would attend if they weren't attending a virtual school. The state produces a report on virtual schooling in aggregate but does not separate the achievement data of students attending virtual schools full-time from those taking one or two classes online. As a result,

overall school ratings for virtual and blended schools were available for only 21 of the 39 states included in this report.

This points to a larger story about school accountability as virtual and blended schools in the United States continue to expand. It is understandable that states are being cautious about holding schools accountable under new provisions; however, gaps in data make it difficult to assess the extent to which virtual and blended schools are successfully meeting student needs. Some states have reported data on individual measures to help parents make decisions about where to send their children to school, but others have not reported any data at all during current transitions.

State School Performance Ratings

As was the case in last year's report, annual state-assigned school performance ratings—usually obtained from school report cards or from datasets published by departments of education in different states—were used as our key measure of school performance. This makes the data comparable to that found in last year's report, although it still suffers from the same limitations as last year: a lack of available data for all states and a high-level look at performance. While annual school report cards often include multiple measures that vary from state to state, they tend to include student performance data in math and English/language arts, graduation rates, and achievement gaps. In some states, measures also include performance in science and social studies; percentage of students taking advanced coursework like Advanced Placement (AP), International Baccalaureate (IB) and dual-credit courses; performance growth; college and career readiness; attendance; staff retention; student and parent satisfaction; and/or ACT/SAT scores. Although the type, number, and weighting of such measures that go into calculating an overall school performance rating vary considerably from state to state, the state-assigned school performance ratings do reflect the educational values of a state. Therefore, overall school performance ratings provide a reasonable representation of an individual school's performance relevant to state expectations.

To determine academic performance, a coding system was used to aggregate results across states. One of three possible ratings was assigned to each school within the 21 states with available overall school performance ratings: "academically acceptable," "academically unacceptable," or "not rated" (meaning that the state assigned overall school performance ratings for 2017-18 but did not do so for that particular school). Information from state education agencies provided guidance about how to interpret the overall performance ratings by state. In cases where state agencies did not make clear what constituted an acceptable or unacceptable rating, we determined a cutoff score based on two factors: an interpretation of the scale being used and the number of schools receiving each rating. After applying this common coding system for individual schools, it was possible to aggregate findings within and across states.[26]

Overall school performance ratings for virtual and blended schools were available for only 21 out of the 39 states included in this year's report, either because an overall rating was not available due to the accountability system being on hold, because the state's accountability system does not include an overall rating, or because the overall ratings for 2017-18 had not

been released in time for the publication of this report. Given current conditions, the school performance results captured here should be interpreted cautiously, since they are inescapably based on limited data.

The 21 states which provided overall school performance ratings on 2017-18 report cards were: Alaska, Arkansas, Arizona, Colorado, District of Columbia, Florida, Georgia, Indiana, Iowa, Louisiana, Massachusetts, Nevada, New Mexico, North Carolina, Ohio, Rhode Island, South Carolina, South Dakota, Texas, Utah, and Wisconsin. This year we have an addition of seven states to the school performance ratings (Alaska, Arkansas, Arizona, District of Columbia, South Carolina, South Dakota, and Ohio), but we lost Pennsylvania due to the change in the rating system (no overall rating available anymore).

Therefore, performance ratings were potentially available for 320 (63.9%) of the 501 full-time virtual schools and 131 (43.7%) of the 300 blended learning schools with enrollment during 2017-18. A slightly higher percentage of both virtual and blended schools received academically unacceptable ratings from their state education agencies for 2017-18, relative to the previous year. Overall, 48.5% of full-time virtual schools were rated acceptable performance ratings, which is higher than last year's 36.4%. A total of 44.6% blended schools were rated acceptable. This is the first time in the last two years that blended schools perform less well than virtual schools.

Of the 320 virtual schools with available school performance ratings, 67 (48.5%) were rated acceptable (see Table 7). Of the 86 rated schools operated by for-profit EMOs, 14 (16.3%) were found acceptable. Of these, eight were K12, Inc. schools, five were Connections schools, and one was Calvert Education Services. Five out of 21 nonprofit schools rated were found acceptable, and 48 independently run virtual schools were rated acceptable (59.3: 56.7% and 40.8% rated acceptable, respectively.

Table 7. Percentage of Virtual Schools with Acceptable School Performance Ratings, 2017-18

	Acceptable		Unacceptable		Not Rated (or No Rating Reported)
	N	Percent of Schools with Ratings	N	Percent of Schools with Ratings	N
Full-Time Virtual	67	48.5%	71	51.5%	182
Independent	48	59.3%	33	40.7%	132
Nonprofit	5	50.0%	5	50.0%	11
For-Profit	14	29.8%	33	70.2%	39
Charter	29	40.8%	42	59.2%	60
District	38	56.7%	29	43.3%	122

The performance level of blended schools increased slightly from last year. 44.6% of blended schools were rated acceptable in 2017-18 compared to 43.1% in 2016-17 and a significant addition of so many blended schools to this year's dataset happened. Table 8 contains key

findings regarding state ratings of blended learning schools.

Unlike last year when almost all the nonprofit blended schools in the dataset were rated academically unacceptable, this year only 55.4% were. Less than half the independent blended schools had acceptable ratings this year (47.8%) unlike last year when the percentage was over the half (52.5%). Compared to 2016-17, this year the district blended performed better than the charter blended schools: 54.8% and 35.3% respectively (in 2016-17 the percentages were 42.1% and 43.6% respectively).

Table 8. Percentage of Blended Schools with Acceptable School Performance Ratings, 2017-18

	Acceptable		Unacceptable		Not Rated (or No Rating Reported)
	N	Percent of Schools with Ratings	N	Percent of Schools with Ratings	N
Full-time Blended	29	44.62%	36	55.38%	66
Independent	22	47.83%	24	52.17%	24
Nonprofit	5	41.67%	7	58.33%	19
For-profit	2	28.57%	5	71.43%	23
Charter	12	35.29%	22	64.71%	36
District	17	54.84%	14	45.16%	30

In addition to the 71 virtual schools that received unacceptable ratings, 182 virtual schools in these states were not rated at all. In some cases, states did not provide ratings because schools did not meet participation rate thresholds; in other cases, the lack of a rating was unexplained. In addition to the 36 blended schools that received unacceptable ratings, 66 blended schools received no rating at all.

Highlights from Select States

Specific numbers of acceptable and unacceptable ratings assigned by states are available and requests for this data sent to the authors will be considered.

Specific numbers of acceptable and unacceptable ratings assigned by states are available in Appendix B (and requests for school-level data will be considered by authors). There were some interesting findings by state that are worth mentioning. Most notable is that Pennsylvania this year didn't have any available overall rating. They stopped working with the previous system and currently their rating system is composed of three systems, State Assessment Measures, On-Track Measures, and College and Career Measures.

In Wisconsin, 24 virtual charter schools received performance ratings. Out of those 24 schools, (70.8%) had an acceptable rating, while (29.2%) had an unacceptable rating. Three schools received the highest rating possible, five received a middle rating, nine received alternative ratings and all of them had a satisfactory rating. This year the number of blended

learning schools dropped from 17 blended schools to seven blended schools, with 57.2% receiving acceptable ratings and 42.9% receiving unacceptable ratings. All of these blended schools were charter schools; three received alternative ratings (two of them were satisfactory and one needed improvement); two received the highest rating possible, and two received the lowest rating possible.

In Louisiana, all five (100%) blended schools received unacceptable ratings; all five were charter schools. Only one of eight virtual schools received an acceptable rating (12.5%), and it was the sole district virtual school in the state.

Finally, in Colorado, of the 23 virtual schools that received ratings, 57.14% were rated unacceptable and 42.86% acceptable. Of these, one charter school had an acceptable rating and the rest of the charter schools were not rated. Of 19 district schools, eight (42.1%) were rated unacceptable and only four (21.1%) acceptable. An additional six schools did not receive ratings, two of them because of the insufficient data. Of the 24 blended schools rated, 45.8% received acceptable ratings; the same percentage received unacceptable ratings. Of the 24 blended schools, six had a charter status. Two-thirds of charter schools were rated unacceptable, while a third were rated as acceptable). Seven (38.9%) of 18 district schools were judged unacceptable while nine (50.0%) were judged acceptable. Another two blended schools were not rated because of insufficient data.

In Florida, many options for virtual schooling exist. Students may enroll in the state-level Florida Virtual School (FLVS) either full-time or part-time (note that only FLVS Full-Time is included in this report), in a District Virtual Instruction Program (VIP), in a District Franchise of FLVS, in a virtual charter school, or in district-offered online courses (also not included in this report). This report includes a total of 74 virtual schools and five blended learning schools. All blended schools were charter schools operated by SIATech. Four out of the five didn't receive any rating and one had unacceptable rating.

Only 34 virtual schools (31 district and three charter schools) received ratings. Twenty-three (67.6%) were rated acceptable, and all of them had an A score as a rating. Compared to 22 district schools that were rated acceptable, only one charter school was rated acceptable. Available data thus suggests that Florida's virtual schools, especially district-operated schools, have a stronger pattern of success than is evident in other states. Still, because an additional 40 schools were not rated, it is difficult to tell whether these numbers are inflated or reasonably representative. Among the 40 schools not rated, five (13.2%) of the not-rated virtual schools were given a grade of I, because testing participation rates did not meet the state's 95% threshold. The other 35 were not listed in state's school grades data set.

Graduation Rates

Four-year graduation rates were obtained from state sources and scrutinized to ensure that each state's measure represented the percentage of all students who graduate from high school within four years after they started ninth grade. Some states distinguish between graduation rates for students receiving traditional diplomas and the rates for students receiving other types of diplomas; in cases where states distinguished between diploma types,

graduation rates representing the sum of all types of diplomas granted were used.

This year only five states had no graduation data available for 2017-18 (Alaska, New Hampshire, Kentucky, Louisiana, Texas). In the other states where graduation rates were available, some of the schools' graduation rates were masked because the number of enrollments was low. Many schools did not report a graduation rate because they do not offer high school grades (either elementary or middle schools); others are relatively new and have not had a student cohort complete Grades 9-12. Of the total 501 virtual schools in the inventory, information on graduation rates was available for 290 (57.9%); of the 300 blended schools, information was available for 144 (48%).

As Table 9 illustrates, the on-time graduation rates for full-time virtual and blended schools (50.1% and 61.5% respectively) were less than the national average of 84%. While still low, these rates suggest a notable improvement, especially for blended schools in comparison with the one reported in previous inventories. In 2016-2017, average graduation rates were 50.7% for virtual schools, which is similar to this year, and 49.5% for blended. The improvement in blended schools may be due in part to a more comprehensive approach to the collection of graduation rate data, but it nevertheless suggests a promising trend in school completion among students in virtual and blended schools.

Table 9. Graduation Rates, 2017-18

Virtual Schools	Number of Schools with Data	Graduation-Rate	Blended Learning Schools	Number of Schools with Data	Graduation-Rate
All Virtual Schools	290	50.1%	All Blended Schools	144	61.5%
Independent Virtual	194	52.8%	Independent Blended	84	60.7%
Nonprofit Virtual	26	49.2%	Nonprofit Blended	33	63.8%
For-Profit Virtual	70	48.5%	For-Profit Blended	27	61.4%
K12 Inc.	39	48.1%	K12 Inc.	6	68.3%
Connections	18	58.7%	Success VLC	10	19.3%
District Virtual	153	50.9%	District Blended	62	58.3%
Charter Virtual	137	49.9%	Charter Blended	82	62.8%
National Average		84%			84%

Current graduation rates across all subgroups of virtual and blended schools are poor compared to the 84% national average. Independently managed virtual schools had the highest rate, 52.8%, while independently managed blended schools have a rate of 60.7%. Rates in for-profit and nonprofit operated virtual schools were 48.5% and 49.2%, respectively. Within the subgroup of EMO-managed virtual schools, the graduation rate for Connections Academy was 58.7%, and for K12, Inc. was 48.1%. While these virtual school graduation rates were relatively close across sectors, rates of for-profit and nonprofit-managed blended schools diverged: 61.4% and 63.8%, respectively.

For the year 2017-18 the graduation rates for blended and virtual charters and districts were opposite to last year. The graduation rates in charter virtual schools were similar to those of

district-operated virtual schools, about 49.9% and 50.9%, respectively. The same comparison can be seen in blended schools where charter blended schools reported graduation rates of (62.8%) and district virtual schools reported (58.3%), which are very close percentages. For-profit and nonprofit virtual schools reported similar rates regardless of charter status, and that happened along the blended schools also, where the nonprofit operated schools had graduation rates of 63.8% and the for-profit blended schools, 61.4%. The performance of independently operated districts was different among virtual and blended schools (they were 52.8% and 60.7%, respectively). In 2017-18 school year, graduation rates for virtual independent, nonprofit, and for-profit operated schools were very close, 52.8%, 49.2%, and 48.5% respectively. For blended schools, the nonprofit operated schools had a small higher rate compared to for-profit and independent, which is similar to last year (2016-17) where independent and nonprofit were very close in graduation rates (55.3%, 57.1%).

Recommendations

Full-time virtual schools and blended learning schools represent promising ideas. Unfortunately, they are performing terribly. As these schools continue to expand they undermine our education systems in two ways. First of all, most students who choose these schools are negatively impacted when it comes to measureable learning. Further, the education system as a whole is hurt as an increasing portion of the public resources available for schools is being syphoned off to the virtual and blended schools, which are largely operated by private education management organizations.

Our study focuses only on full-time virtual schools and full-time blended learning schools. We understand that districts and individual schools are creating virtual and blended learning "programs". We also know that teachers within traditional public schools are innovating and increasingly engaging in blended learning. Although we know little about these programs and classroom innovations, it is assumed that they maintain lower and more suitable student-to-teacher ratios which would likely result in better outcomes. More research is needed to understand if efforts within districts and schools might demonstrate features or strategies that might yield successful outcomes.

Given the overwhelming evidence related to the poor performance of full-time virtual and blended learning schools, we include the following recommendations for policymakers.

- Slow or stop the growth in the number of virtual and blended learning schools and the size of their enrollments until the reasons for their relatively poor performance have been identified and addressed.

- Implement measures that require virtual and blended schools to reduce their student-to-teacher ratios.

- Enforce sanctions for virtual and blended schools that perform inadequately.

- Sponsor research on virtual and blended learning "programs" and classroom innovations within traditional public schools and districts.

Notes and References Section I

1   The authors will consider requests to obtain or review the school-level data sets from which findings are based.

2   Miron, G., & Urschel, J.L. (2012). *Understanding and improving full-time virtual schools: A study of student characteristics, school finance, and school performance in schools operated by K12 Inc.* Retrieved December 11, 2014, from https://nepc.colorado.edu/publication/understanding-improving-virtual;

Molnar, A. (Ed.); Miron, G., Huerta, L., Cuban, L., Horvitz, B., Gulosino, C., Rice, J.K., & Shafer, S.R. (2013). *Virtual schools in the U.S. 2013: Politics, performance, policy, and research evidence.* Boulder, CO: National Education Policy Center. Retrieved December 18, 2015, from http://nepc.colorado.edu/publication/virtual-schools-annual-2013;

Molnar, A. (Ed.); Rice, J.K., Huerta, L., Shafer, S. R., Barbour, M.K., Miron, G., Gulosino, C., Horvitz, B. (2014) *Virtual schools in the U.S. 2014: Politics, performance, policy, and research evidence.* Boulder, CO: National Education Policy Center. Retrieved December 18, 2015, from http://nepc.colorado.edu/publication/virtual-schools-annual-2014;

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Miron, G., & Shank, C., & Davidson, C. (2018). *Full-time virtual and blended schools: Enrollment, student characteristics, and performance.* Boulder, CO: National Education Policy Center. Retrieved November 20, 2018, from http://nepc.colorado.edu/publication/virtual-schools-annual-2018

3   The authors will consider requests to obtain or review the school-level data sets from which findings are based.

4   For example, school districts or schools offer online courses to cut costs or attract students from other schools/districts/states. These are not actually schools in the sense that they offer the complete state-mandated curriculum; they are just basically individual courses that students can take if they want to. Such a program would never receive an NCES ID no matter how many students enroll in these online courses because it's not a school. Although no systematic data is available, some speculate that districts may be using the virtual programs as a way to place or "park" students who are not succeeding in the face-to-face classes due to learning obstacles or disciplinary reasons.

5   We considered creating a comparison group by aggregating the data for the 38 states with either virtual or blended schools. We found in the NCES data set, however, that some key states were already lacking data on charter school since the states were not reporting the charter school data separate from the local district data.

6   Special education is an obligation of school districts (i.e., Local Education Authorities) and not necessarily individual schools. In most states, charter schools are considered LEAs and therefore their data on special education is included in the NCES district-level datasets. States in which charter schools are not classified as LEAs, such as Florida, do not have special education data attributable to individual charter schools.

7   Compiling an aggregate data set of the 39 states would have been possible, albeit time consuming. Unfortunately, focusing on data from the 39 states would have introduced other problems since a few of these larger

states were inconsistently reporting school level data for charter schools which serve most students in virtual and blended learning schools.

8   Iowa, Kentucky, Maine, Massachusetts, South Carolina, and South Dakota.

9   To be included in this inventory and considered in our analyses, a virtual school or blended learning school has to meet our selection criteria. First of all, it must be classified as a school and not a program. For example, it must be classified as a functioning school and not just a collection of individual optional courses. Online courses offered by school districts or schools to cut costs or attract students from other schools/districts/states, as referred to in Note 3, are therefore not included.

Additionally, when separating programs from schools, we look for the existence of unique NCES or State Education Agency ID codes that are designated for school units. We exclude blended schools, and we avoid schools that have both face-to-face instruction and virtual instruction. Further, in order to be included in our inventory, these virtual schools should have evidence of at least 10 students enrolled during one of the last few years. An important part of our analyses examines school performance; by including only full-time virtual schools, we are better able to attribute school performance outcomes to full-time virtual schools.

10   Estimates for 2000 to 2010 are based on two sources, the annual *Profiles of For-Profit and Nonprofit Education Management Organizations* from NEPC, and the annual *Keeping Pace* reports from Evergreen Education, a consulting group that prepares reviews of policy and practice for online learning.

11   Miron, G., & Urschel, J.L. (2012). *Understanding and improving full-time virtual schools: A study of student characteristics, school finance, and school performance in schools operated by K12 Inc.* Retrieved December 11, 2014, from http://nepc.colorado.edu/files/nepc-rb-k12-miron.pdf;

Woodard, C. (2013, July 3). Special report: The profit motive behind virtual schools in Maine. *Portland Press Herald*. Retrieved February 28, 2014, from http://www.pressherald.com/news/virtual-schools-in-maine_2012-09-02.html

12   Data on ethnicity are from 2016-17, the most recent year from which we could obtain NCES data. The NCES provides the most comprehensive data, all from a single audited source, which is why we relied on this source.

13   Note that we compare virtual and blended schools from 39 states with the national average representing 50 states. A comparison group of 39 states would likely be slightly closer to the distribution in virtual and blended schools. The eleven states that might be pulled out from the national average, however, are all very low population states and would have minimal influence on the national average. Ideally, it would be preferable to compare demographics for each virtual or blended school with the population in the actual catchment area from which they enroll students. Such analyses are beyond the scope and budget of this study.

14   Comparisons with demographic composition of charter schools in the nation are also relevant since the virtual schools that enroll most students are charter virtual schools. Thirty-six percent of all charter school students are white, 29.2% are black, 27.2% are Hispanic, 3.5 are Asian, and 3.2% are classified as "other."

15   Ahn, J., & McEachin, A. (2017). Student enrollment patterns and achievement in Ohio's online charter schools. *Educational Researcher, 46*(1), 44–57. https://doi.org/10.3102/0013189X17692999

An additional study also examines shifting enrollments in Pennsylvania virtual schools over time and some key financial consequences. See Mann, B., & Baker, D.P. (2019, February) Cyber charter schools and growing resource inequality among public districts: Geospatial patterns and consequences of a statewide choice policy in Pennsylvania, 2002–2014, *American Journal of Education 125*(2), 147-171.

16   Miron, G. (2014). Charters should be expected to serve all kinds of students . *Education Next 14*(4), 58-59.

17   For example, one Ohio school with an exceptionally high rate of special education student enrollment (22.1%) actively promotes their school environment for students with disabilities seeking a least restrictive environment. A post on the school website explains that a team of educators meets with each family of a child with

disabilities to create an IEP outlining services to be provided by the school.

18 Miron, G., & Urschel, J.L. (2012). *Understanding and improving full-time virtual schools: A study of student characteristics, school finance, and school performance in schools operated by K12 Inc.* Retrieved December 11, 2014, from http://nepc.colorado.edu/files/nepc-rb-k12-miron.pdf

19 A recent study on this topic, apparently from smaller virtual schools, used a qualitative approach to explore the experiences of six online teachers teaching students with disabilities. This study found the teachers used a variety of strategies to accommodate students with disabilities, including modifying curriculum, adapting instructional practices, and drawing on outside resources for support. The study recommended that virtual schools should promote a teacher-focused approach to accommodating the needs of students with disabilities and their parents.

Crouse, T.M., Rice, M.F., & Mellard, D.F. (2016). *"How did I survive?" Online teachers describe learning to teach students with disabilities.* Lawrence, KS: Center on Online Instruction and Students with Disabilities, University of Kansas.

20 This statistic is based on NCES data from U.S. Department of Education, National Center for Education Statistics. (2015). The Condition of Education 2015 (NCES 2015-144), English Language Learners. Retrieved December 2, 2015, from https://nces.ed.gov/fastfacts/display.asp?id=96

21 *State Nonfiscal Public Elementary/Secondary Education Survey*, 2011-12 v.1a. United States Department of Education, National Center for Education Statistics, Common Core of Data (CCD).

22 The pupil/teacher ratios have remained consistently around 16 to 1 over the past several years. Projections also suggest that this ratio is likely to remain consistent for public schools.

NCES (2016). The Table 208.20. *Public and private elementary and secondary teachers, enrollment, pupil/ teacher ratios, and new teacher hires: Selected years, fall 1955 through fall 2026.* Washington DC: National Center for Education Statistics. 2013-441. U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved December 1, 2014, from https://nces.ed.gov/programs/digest/d16/tables/dt16_208.20.asp

23 Such a low number of full-time equivalent teachers reported may be explained by the use of larger numbers of teachers who work part-time for the school.

24 Miron, G., & Urschel, J. (2012). *Understanding and improving full-time virtual school: a study of student characteristics, school finance, and school performance in schools operated by K12, Inc.* Boulder, CO: National Education Policy Center. Retrieved November 27, 2018 from https://nepc.colorado.edu/publication/understanding-improving-virtual

25 Miron, G., Shank, C., & Davidson, C. (2018). Full-time virtual and blended schools: Enrollment, student characteristics, and performance . Boulder, CO: National Education Policy Center. Retrieved November 20, 2018, from http://nepc.colorado.edu/publication/virtual-schools-annual-2018

26 It is important to note that states' respective standards & expectations vary, with some states setting high standards and others being more lenient.