Virtual Schools in the U.S. 2023



Alex Molnar, Series Editor
University of Colorado Boulder

May 2023

National Education Policy Center

School of Education
University of Colorado Boulder
nepc.colorado.edu

Acknowledgements

NEPC Staff

Faith Boninger
Publications Manager

Margaret Balch-Gonzalez
Academic Editor

Elaine Duggan
Production Design

Alex Molnar
NEPC Director

Kevin Welner
NEPC Director

Suggested Citation: Molnar, A. (Ed.), Miron, G., Hagle, S., Gulosino, C., Mann, B., Huerta, L.A., Rice, J.K., Glover, A., & Bill, K. (2023). *Virtual schools in the U.S. 2023*. Boulder, CO: National Education Policy Center. Retrieved [date] from http://nepc.colorado.edu/publication/virtual-schools-annual-2023

Funding: This research brief was made possible in part by funding from the Great Lakes Center for Educational Research and Practice.

Peer Review: *Virtual Schools in the U.S. 2023* was double-blind peer-reviewed.

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.

This publication is provided free of cost to NEPC's readers, who may make non-commercial use of it as long as NEPC and its author(s) are credited as the source. For inquiries about commercial use, please contact NEPC at nepc@colorado.edu.

The National Education Policy Center (NEPC), a university research center housed at the University of Colorado Boulder School of Education, sponsors research, produces policy briefs, and publishes expert third-party reviews of think tank reports. NEPC publications are written in accessible language and are intended for a broad audience that includes academic experts, policymakers, the media, and the general public. Our mission is to provide high-quality information in support of democratic deliberation about education policy. We are guided by the belief that the democratic governance of public education is strengthened when policies are based on sound evidence and support a multiracial society that is inclusive, kind, and just. Visit us at: http://nepc.colorado.edu

Virtual Schools in the U.S. 2023

Alex Molnar, Series Editor

Executive Summary

Alex Molnar
University of Colorado Boulder

May 2023

Over the past two and a half decades, digital technologies and virtual education have moved quickly to the top of the K–12 public education reform agenda. Proponents, including business leaders, school reform organizations, foundations, and for-profit and nonprofit service providers, argue that virtual technology will revolutionize teaching and learning, dramatically reduce the cost, and expand the availability of high-quality education. If this sounds too good to be true, it could be because it's not true.

By 1999, politicians, educators, policymakers, corporate executives, and community leaders had already become vocal advocates of computer/internet technology in the schools. Software and hardware companies claimed only to be responding to the market's demands for their products. In fact, they had and continue to have a guiding hand in developing the school market and in creating the policy environment in which digital technologies in education can flourish. In a 1999 paper discussing the link between emerging digital technologies and commercialism, Molnar noted that although digital technologies represented an opportunity to positively transform the processes of teaching and learning, the role and relative emphasis that should be given to electronic technologies in school reform was far from settled.[1] He concluded that while commercialized programs promising free hardware and/or software and/or internet access would appeal to many schools, the question being ignored was whether and under what circumstances commercialized programs are likely to do more harm than good.

Twenty-five years later, this question has yet to be seriously addressed, even as the data collected by digital technologies has become a major corporate profit center. A mountain of flamboyant marketing claims, along with pervasive conventional wisdom, assert that schools will be improved by using digital technologies, and that the widespread availability of virtual schooling will bring opportunities to learn and academic success to communities and

students who might otherwise be left behind. At the same time, there is a dearth of research that supports either the claims or the conventional wisdom.

Virtual education now takes many forms and serves many purposes. Formats include full-time online K–12 schools as well as single courses that allow students to explore a subject not available in their brick-and-mortar schools. Virtual education is also sometimes used by students to make up credits for a required course they had earlier failed (i.e., for credit recovery). Some virtual education programs require students and teachers to be online at the same time (synchronous education); others allow students and teachers to visit online courses at their own convenience (asynchronous education). Others combine online work with in-person classroom instruction (blended instruction). Providers include public entities, nonprofit organizations, and for-profit companies.

While there may not be much research support for digital education, there is a lot of money to be made from it. The technology industry has been chasing this money for years.[2] As far back as 2004, Bracey detailed the financial and political interests promoting Knowledge Universe and its K–12 division, an early leader in the virtual school industry.[3] Writing in 2009, Glass recommended that because of the potential impact of private investment, virtual schools should be subject to new regulations and audits, as well as credible assessments, accreditation requirements, and audits. He pointed out that:

> Private commercial interests, whether non-profit or profit-making, have recognized a huge potential market in virtual schooling.... Private virtual education providers are vigorously lobbying state legislatures to gain entry into the business of public education. This relationship between state and federal governments and private corporations is only mentioned to illustrate the close connections that are beginning to have significant effects on public education policy.[4]

In 2011, Glass and Welner repeated these recommendations and added a call for new fiscal and instructional regulations appropriate to virtual schools (for example, to authenticate the work done by virtual school students).[5] Justin Bathon reviewed state virtual school legislation and offered model legislative language to address the issues identified by Glass, Welner, and others.[6]

In 2012, after documenting the poor performance of K12 Inc.'s virtual schools, Miron and Urschel recommended slowing or putting a moratorium on the growth of full-time virtual schools, revising their performance and accountability, and revising the related funding formulas and financial oversight. They also offered 16 questions about virtual schools that they argued should be taken up by researchers.[7]

As the issue of virtual school funding grew in importance, in 2013 Baker and Bathon recommended that:

- [Online education and virtual school] alternatives should be funded based on the instructional units provided to students to advance their progress toward program completion. Using brick-and-mortar rates as the basis for funding online offerings is inap-

propriate; the scope of services provided by OE/VS alternatives varies so greatly that an offering is rarely, if ever, equivalent to that provided in a traditional setting offering a full complement of services.

- Maximum subsidy rates for online instructional units should not exceed the costs of producing the same unit in the brick-and-mortar setting.
- States should consider determining the average costs for various units of traditional brick-and-mortar courses, particularly at the secondary level, to provide a base for calculating state subsidies for full-time online program as well as for calculating for school district subsidies for supplemental online courses.[8]

Since 2013, NEPC has published nine comprehensive reports on the performance of U.S. virtual schools, including this one.[9] Six of the earlier reports also provided reviews of the research literature on virtual education and the policy landscape related to virtual schools. In this 10-year period, little has changed. Virtual schools in general perform poorly, state virtual school policies remain inadequate, and little if any research supports the claims being made for virtual education. And yet virtual schools continue to spread. No doubt this is in large part because: The policy environment remains, if not friendly, then indifferent; oversight is lax; and millions of dollars from profit-seeking investors promote the enterprise. Whatever the reasons for their continued spread may be, however, virtual schools are clearly not spreading based on research evidence. Despite their poor performance, the heavily financed flood of technological and business model innovations has far outpaced research on the impact of virtual teaching and learning.

Molnar and Boninger observed in the Executive Summary to the 2021 Virtual Schools report that the COVID-19 pandemic pushed virtual schooling to the forefront of the national educational landscape and had a lingering impact on schools generally.[10] They noted that during the height of the pandemic, corporations, tech industry trade associations, philanthropists, and venture capitalists—all of whom had been promoting virtual education for over a decade[11]—quickly positioned digital programs and platforms as the obvious solution for schools that had to close buildings to avoid transmitting the virus.[12] They also commented that the nation's experience with virtual technologies during the pandemic put a spotlight on serious problems with the rosy pre-pandemic vision of a bright new virtual future[13] Teachers, students, and parents struggled—with mixed success—to adjust to the virtual education technologies.[14] Despite such problems, virtual schools are now promoted by many as the key to building a post-crisis "new normal" for the core education infrastructure in a radically altered school environment.[15]

As Molnar and Boninger further pointed out, proponents made the case that virtual schools can beneficially expand student choices while improving the efficiency of public education,[16] but the research evidence tells a different story: Full-time virtual schools have yielded very poor outcomes.[17] Finally, Molnar and Boninger link the use of digital platforms and learning programs to significant threats to the integrity of schools' curriculum and instruction programs, student assessments, and data collection and recordkeeping practices.[18] They point out that compared to the surface transparency of traditional textbooks, tests, and record books, much is hidden behind the proprietary curtain of virtual technologies.[19]

Purpose of This Report

Virtual Schools in the U.S. 2023 provides scholarly analyses of the characteristics and performance of full-time, publicly funded K–12 virtual schools; reviews the relevant available research related to virtual school practices; provides an overview of recent state legislative efforts to craft virtual school policy; and offers policy recommendations based on the available evidence. The report is organized into three sections:

Section I, *Full-Time Virtual Schools: Enrollment, Student Characteristics, and Performance*, documents the number of full-time virtual schools, their student characteristics, and their performance. Miron, Hagle, and Gulosino find that compared to brick-and-mortar schools, virtual schools' student academic performance continues to lag, class sizes are larger, and fewer students living in poverty and minority students are served.

Section II, *Assessing Virtual Schools After a Global Pandemic: A Reality of Unfulfilled Promises,* reviews the relevant available research literature related to full-time virtual schools. Bryan Mann finds that there is still surprisingly little known about the efficacy of online education or digital technologies generally, or about individual approaches specifically. Section II examines eight major claims made by virtual school proponents and finds little research evidence to support any of them.

Section III, *Key Policy Issues in Virtual Schools: Finance and Governance, Instructional Quality, and Teacher Quality*, provides a review of state legislative activity related to virtual schools. Huerta, Rice, Glover, and Bill find that despite continued legislative interest in virtual schools, little progress has been made to address well-known issues of finance, governance, instructional quality, and teacher quality. They note that there is scant evidence that legislation is guided by research.

Select Recommendations Arising From Section I

It is recommended that policymakers:

- Require federal and state education agencies to accurately identify and monitor full-time virtual schools, remedying gaps in information transparency on performance measures and accountability.
- Establish requirements for reduced student-to-teacher ratios and regular contact between teachers and online students.
- Slow or stop the growth of virtual schools until substantial academic and/or non-academic outcomes improve and benefits are comparable with brick-and-mortar public schools.

Select Recommendations Arising From Section II

It is recommended that state policymakers:

- Require Individualized Education Plans for all students in virtual schools, akin to those special education students receive. The plans should indicate if students need standardized or personalized programs and then deliver content according to these plans.
- Require virtual school graduation rates to align with statewide averages. If the virtual school fails to meet these benchmarks, assign it probationary status after a year and close after five years of probationary status.
- Require virtual schools to maintain a within-school-year student mobility threshold equal to the mobility rate of brick-and-mortar schools.

Select Recommendations Arising From Section III

It is recommended that policymakers:

- Develop new accountability structures for virtual schools, calculate the revenue needed to support them, and provide adequate funding.
- Require high-quality curricula, aligned with applicable state and district standards, and monitor changes to digital content.
- Delineate the definitions of adequate quantity of instruction to ensure subject mastery.
- Examine the work and responsibilities of virtual school administrators and ensure that those hired for these roles are prepared with the knowledge and skills to be effective, particularly with respect to evaluating teachers and promoting best practices.

Notes and References Executive Summary

1 Molnar, A. (1999, April). *Integrating the schoolhouse and the marketplace: A preliminary assessment of the emerging role of electronic technology*. Milwaukee, WI: University of Wisconsin-Milwaukee, Center for the Analysis of Commercialism in Education. Retrieved March 21, 2023, from https://nepc.colorado.edu/sites/default/files/publications/CACE-99-22%20%28Integrating%20the%20Schoolhouse%20and%20the%20Marketplace.pdf

2 The work of Douglas D. Noble is informative on this subject. See Noble, D.D. (1997). A bill of goods: The early marketing of computer-based education and its implications for the present moment. In B.J. Biddle, T.L. Good, & I.F. Goodson (Eds.), *International handbook of teachers and teaching* (pp. 1321–1385).

Dordrecht, Netherlands: Kluwer Academic Publishers; and Noble, D.D. (1991). *Classroom arsenal: Military research, information technology, and public education* (London, UK: Falmer Press).

3 Bracey, G.W. (2004, April). *Knowledge universe and virtual schools: Educational breakthrough or digital raid on the public treasury?* Tempe, AZ: Arizona State University, Education Policy Studies Laboratory, Education Policy Research Unit. Retrieved March 23, 2023, from https://nepc.colorado.edu/sites/default/files/EPSL-0404-118-EPRU.pdf

4 Glass, G.V (2009, April). *The realities of K–12 virtual education* (pp. 11–13). Boulder, CO: Education and the Public Interest Center, and Tempe, AZ: Education Policy Research Unit. Retrieved March 23, 2023, from https://nepc.colorado.edu/sites/default/files/PB-Glass-VIRTUAL.pdf

5 Glass, G.V & Welner, K.G. (2011, October). *Online K–12 schooling in the U.S.: Uncertain private ventures in need of public regulation* (pp. 13–14). Boulder, CO: National Education Policy Center. Retrieved March 23, 2023, from https://nepc.colorado.edu/sites/default/files/NEPC-VirtSchool-1-PB-Glass-Welner.pdf

6 Bathon, J. (2011, October). *Model legislation related to online learning opportunities for students in public elementary and secondary schools*. Boulder, CO: National Education Policy Center. Retrieved March 23, 2023, from https://nepc.colorado.edu/sites/default/files/NEPC-VirtSchool-2-LB-Bathon.pdf

7 Miron, G. & Urschel, J.L. (2012, July). *Understanding and improving full-time virtual schools: A study of student characteristics, school finance, and school performance in schools operated by K12 Inc*. Boulder, CO: National Education Policy Center. Retrieved March 23, 2023, from https://nepc.colorado.edu/sites/default/files/nepcrbk12miron.pdf

8 Baker, B.D. & Bathon, J. (2013, October). *Financing online education and virtual schooling: A guide for policymakers and advocates* (Executive Summary). Boulder, CO: National Education Policy Center. Retrieved March 23, 2023, from https://nepc.colorado.edu/sites/default/files/lb-pb-onlineedfinancing-policy_0.pdf

9 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 March 23, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2013/

10 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 March 23, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2014

Molnar, A. (Ed.), Huerta, L., Shafer, S.R., Barbour, M.K., Miron, G., & Gulosino, C. (2015). *Virtual schools in the U.S. 2015: Politics, performance, policy, and research evidence*. Boulder, CO: National Education Policy

Center. Retrieved March 23, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2015

Miron, G. & Gulosino, C. (2016). *Virtual schools report 2016: Directory and performance review*. Boulder, CO: National Education Policy Center. Retrieved March 23, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2016

Molnar, A. (Ed.), Miron, G., Gulosino, C., Shank, C., Davidson, C., Barbour, M.K., Huerta, L., Shafer, S.R., Rice, J.K., & Nitkin, D. (2017). *Virtual schools report 2017*. Boulder, CO: National Education Policy Center. Retrieved March 23, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2017

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 March 23, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2018

Molnar, A. (Ed.), Miron, G., Elgeberi, N., Barbour, M.K., Huerta, L., Shafer, S.R., & Rice, J.K. (2019). *Virtual schools in the U.S. 2019*. Boulder, CO: National Education Policy Center. Retrieved March 23, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2019

Molnar, A. (Ed.), Miron, G., Barbour, M.K., Huerta, L., Shafer, S.R., Rice, J.K., Glover, A., Browning, N., Hagle, S., & Boninger, F. (2021). *Virtual schools in the U.S. 2021*. Boulder, CO: National Education Policy Center. Retrieved March 23, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2021

Molnar, A. (Ed.), Miron, G., Barbour, M.K., Huerta, L., Shafer, S.R., Rice, J.K., Glover, A., Browning, N., Hagle, S., & Boninger, F. (2021). *Virtual schools in the U.S. 2021*. Boulder, CO: National Education Policy Center. Retrieved March 21, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2021

11 From June 2016 through December 2018, Audrey Watters posted a series of blog posts on the education technology industry and its connection to venture capital. Find those posts here:

Watters, A. (2018, December). The education technology industry network: A Hack Education project. Retrieved April 19, 2021, from http://network.hackeducation.com/blog/

See also:

Holon IQ. (2020). *EdTech started the decade with $500m of venture capital investments in 2010 and finished 14x higher at $7B in 2019. We expect over $87bn to be invested over the next 10 years, almost triple the prior decade*. Retrieved April 19, 2020, from https://www.holoniq.com/notes/87bn-of-global-edtech-funding-predicted-to-2030/

Wolf, M.A. (2010). *Innovate to educate: System [re]design for personalized learning: A report from the 2010 Symposium*. Washington, DC: Software and Information Industry Association (SIIA). Retrieved April 19, 2021, from https://library.educause.edu/-/media/files/library/2010/1/csd6181-pdf

For analysis, see:

Boninger, F., Molnar, A., & Saldaña, C.M. (2019). Personalized learning and the digital privatization of curriculum and teaching (pp. 17–18, 44–48). Boulder, CO: National Education Policy Center. Retrieved July 13, 2020, from http://nepc.colorado.edu/publication/personalized-learning

Saltman, K.J. (2018). *The swindle of innovative educational finance*. Minneapolis, MN: University of Minnesota Press.

12 Williamson, B. & Hogan, A. (2020, July). *Commercialisation and privatisation in/of education in the context of Covid-19*. Brussels, Belgium: Education International. Retrieved April 19, 2020, from https://issuu.com/educationinternational/docs/2020_eiresearch_gr_commercialisation_privatisation?fr=sZDJkYjE1ODA2MTQ

13 Molnar and Boninger cite the following sources:

Ali, S.S. (2020, September 20). Miami-Dade Public Schools' remote learning platform endures days of cyberattacks. *NBC News*. Retrieved April 20, 2021, from https://www.nbcnews.com/news/us-news/miami-dade-public-schools-remote-learning-platform-endures-days-cyberattacks-n1239129

K12 SIX. (2021, February). *The K–12 cyber incident map*. Fairfax, VA: K12 Security Information eXchange. Retrieved April 20, 2021, from https://k12cybersecure.com/map/

Associated Press. (2020, September 11). Northern Virginia school system hacked, data held for ransom. *AP NEWS*. Retrieved April 20, 2021, from https://apnews.com/article/technology-service-outages-hacking-virginia-c5e1fedcb19ba9d87b8c2c73779350b5

K12 SIX. (2021, February). *The K–12 cyber incident map*. Fairfax, VA: K12 Security Information eXchange. Retrieved April 20, 2021, from https://k12cybersecure.com/map/

Cullinane, A. (2020, March 31). FBI investigating after two Massachusetts online classrooms hijacked by hackers. *Channel 6 News, WRGB Albany*. Retrieved April 20, 2021, from https://cbs6albany.com/news/nation-world/fbi-investigating-after-two-massachusetts-online-classrooms-hijacked-by-hackers

K12 SIX. (2021, February). *The K–12 cyber incident map*. Fairfax, VA: K12 Security Information eXchange. Retrieved April 20, 2021, from https://k12cybersecure.com/map/

14 Molnar and Boninger cite the following sources:

Willingham, A.J. (2020, September 8). Parents' biggest frustration with distance learning. *CNN Philippines*. Retrieved April 20, 2021, from https://www.cnn.com/2020/09/08/us/distance-learning-problems-parents-trnd/index.html

15 Molnar and Boninger cite the following source:

Williamson, B. & Hogan, A. (2020, July). *Commercialisation and privatisation in/of education in the context of Covid-19*. Brussels, Belgium: Education International. Retrieved April 19, 2021, from https://issuu.com/educationinternational/docs/2020_eiresearch_gr_commercialisation_privatisation?fr=sZDJkYjE1ODA2MTQ

See also, for example:

Gallagher, S. & Palmer, J. (2020, September 29). The pandemic pushed universities online. The change was long overdue. *Harvard Business Review*. Retrieved April 19, 2021, from https://hbr.org/2020/09/the-pandemic-pushed-universities-online-the-change-was-long-overdue

Software & Information Industry Association (SIIA). (2021, April 16). *EdTech community continues conversation on 2021 policy priorities with FCC and Department of Education* [press release]. Washington, DC: SIIA. Retrieved April 19, 2021, from https://www.siia.net/edtech-community-continues-conversation-on-2021-policy-priorities-with-fcc-and-department-of-education/

16 Molnar and Boninger cite the following sources:

Office of Educational Technology, U.S. Department of Education. (n.d.). *School leader digital learning guide*. Retrieved April 19, 2021, from https://tech.ed.gov/files/2021/01/School-Leader-Digital-Learning-Guide.pdf

Office of Educational Technology, U.S. Department of Education. (n.d.). *Teacher digital learning guide*. Retrieved April 19, 2021, from https://tech.ed.gov/files/2021/01/Teacher-Digital-Learning-Guide.pdf

17 The National Education Policy Center has produced research reports on the performance of virtual schools since 2013. They are all available at https://nepc.colorado.edu/publications/research-briefs

18 Boninger, F., Molnar, A., & Saldaña, C.M. (2019). *Personalized learning and the digital privatization of curriculum and teachin*g. Boulder, CO: National Education Policy Center. Retrieved April 19, 2021, from http://nepc.colorado.edu/publication/personalized-learning

19 Boninger, F., Molnar, A., & Saldaña, C. (2020). *Big claims, little evidence, lots of money: The reality behind the Summit Learning Program and the push to adopt digital personalized learning platforms* (p. 19). Boulder, CO: National Education Policy Center. Retrieved April 19, 2021, from http://nepc.colorado.edu/publication/summit-2020

NEPC
NATIONAL EDUCATION POLICY CENTER

Section I

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

Gary Miron and Shelby Hagle
Western Michigan University

Charisse Gulosino
University of Memphis

May 2023

Executive Summary

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 curriculum and instruction via the internet and electronic communication, usually asynchronously with students at home and teachers at a remote location.

This report focuses only on full-time virtual schools. During the pandemic a large portion of primary and secondary schools switched to virtual instruction for some of the most challenging months. Please note that this report does not include schools making these temporary changes. This section includes a detailed overview and inventory[1] of full-time virtual schools. Also included are key findings related to student demographics, school characteristics, and state-specific school performance measures. Evidence indicates that student and school characteristics differ considerably from characteristics of traditional, brick-and-mortar public schools.

Data for virtual schools also indicate that they are performing poorly, a finding that has not changed either in NEPC's 10 reports on virtual schools since 2012, or in other national studies. Even while outcomes are often abysmal, enrollment growth has continued. Dominating this sector within the public school system are for-profit education management organiza-

tions (EMOs) that operate exceedingly large virtual schools. School districts are becoming more active in opening virtual schools, but district-run schools have typically been small, with limited enrollment.

Current Scope and Growth of Full-Time Virtual Schools

- A total of 726 full-time virtual schools met selection criteria for the 2021-22 school year, 249 more than existed in 2019-20, which was the reference year for our previous report. Between 2019-20 (pre-pandemic) and 2020-21, enrollment in full-time virtual schools nearly doubled, increasing from 332,379 students to 643,930 a year later (an increase of 331,551 students). Given the rapid increase in enrollment during the pandemic, it is interesting to note that as the pandemic eased up between 2020-21 and 2021-22 school years, enrollments in full-time virtual schools declined by 65,000 students. This drop in enrollments occurred even though the net number of full-time virtual schools continued to grow.
- One third of all virtual schools are organized as charter schools (33.3%), but together they accounted for 58.4% of enrollment. Districts created 245 new full-time virtual schools during the pandemic, while charter schools added only a net of four virtual schools. The district schools added 160,000 students over the past two years, while charter schools added 86,000 students.
- Virtual schools operated by for-profit EMOs were around two and a half times as large as other virtual schools. They enrolled an average of 1,483 students. In contrast, those operated by nonprofit EMOs enrolled an average of 656 students, and independent virtual schools enrolled an average of 562.
- Although for-profit and nonprofit EMOs operated only 32% of full-time virtual schools, those schools enrolled 52% of all virtual school students.

Student Demographics

- Full-time virtual schools have tended to enroll fewer minority students compared to national public school enrollment. During the pandemic, although most minority groups increased their numbers in virtual schools, the proportion of Hispanic students was still eight percentage points lower than national norm.
- Virtual schools continue to educate substantially fewer low-income students relative to national public school enrollment, and this gap increased during the pandemic.
- While the population in the nation's public schools is slightly weighted toward males (51.3% males and 48.7% females), the 2021-22 student population in virtual schools was skewed toward females: 51.9% females and 48.1% males.

Student-Teacher Ratios

- The average student-teacher ratio in the nation's public schools was 14.8 students per teacher. Virtual schools reported having 1.65 times as many students per teacher (24.4).
- Higher numbers of students per teacher at virtual schools were associated with lower graduation rates and school performance ratings.

School Performance Findings

- Because many states continue to have frozen accountability systems or to have implemented new systems excluding overall school ratings, only 18 of 35 states with virtual schools had data on school performance available. Still, compared to prior reports, much more data was available overall. Because the 2021-22 results were relatively incomplete, we also did a second analysis that considered the school rating for the most recent year available. We limited this to the last three years and found that the total number of schools with a rating jumped from 296 to 380.
- Overall, many virtual schools continued to receive low performance ratings, with the proportion of acceptable ratings for virtual schools in 2021-22 dropping to 41.2%. This is a slight drop from 2019-20 when 42.8% of virtual schools received acceptable ratings. When we consider schools who had performance ratings from one of the last three years, we were able to add 40 more schools to our analysis, but the outcome was similar, with 42.6% of virtual schools receiving an acceptable ratings from their respective state education agency.
- Although the overall performance of virtual schools was poor, the report highlights some exceptions as well as a few examples of especially poorly performing states.
- Four-year graduation rate data were available for 228 full-time virtual schools. The graduation rate of 65.1% in virtual schools fell far short of the overall average national graduation rate of 86.5%. Our analysis with 409 virtual schools that had graduation rate data for at least one of the last three years (most recent year), found a graduation rate of 61.9%.
- District-operated virtual schools reported higher graduation rates than virtual charter schools (66.7% graduation rate compared with 59.4% for charter virtual schools).

Recommendations

In light of current evidence that full-time virtual schools continue performing poorly, we recommend that policymakers:

- Require federal and state education agencies to accurately identify and monitor full-

time virtual schools, remedying gaps in information transparency on performance measures and accountability.

- Ensure and enforce sanctions for virtual schools performing inadequately.
- Enhance performance accountability mechanisms to inform funding, renewal, nonrenewal, and revocation decisions.
- Establish requirements for reduced student-to-teacher ratios and regular contact between teachers and online students.
- Slow or stop the growth of virtual schools until substantial academic and/or non-academic outcomes improve and benefits are comparable with brick-and-mortar public schools.
- Sponsor research on full-time virtual schools. This research also needs to focus on alternative models for full-time virtual schools such as school- or district-run programs, as well as the promising models for blended learning.
- Develop project and grant priorities that document best practices and promising models for virtual schools, including district efforts born of the pandemic. Promote cross-sector collaborations and partnerships to strengthen professional development for teachers and the quality and rigor of students' online learning experiences.
- Convene events with scholars, practitioners, representatives from state and federal education agencies, and other policymakers to carefully design a model for full-time virtual schools that can work. Such a model should include finance and oversight mechanisms ensuring that virtual schools focus on the interests of taxpayers and students, not of corporations.

Section I

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

Gary Miron and Shelby Hagle[i]
Western Michigan University

Charisse Gulosino
University of Memphis

May 2023

Introduction

Since 2012, the National Education Policy Center has issued research reports on full-time virtual schooling at the primary and secondary levels.[2] Between 2015 and 2021, full-time blended learning schools were also included in these reports. In addition to a wide range of related policy issues, topics covered in this series of reports have included who is enrolling in virtual schools, what the characteristics of these schools are, and how these schools are performing. As a national inventory, these reports are intended to track developments and inform policymakers and education officials about this fast-growing form of school choice.

This section of the report documents a few of the most tumultuous years for primary and secondary schooling, as this sector was heavily impacted by the COVID-19 pandemic. The section devotes considerable attention to detailing how and where virtual schools expanded during the pandemic.

Between 2016 and 2020, there was very slow growth in the total number of new virtual schools opened. During this time, the average enrollment in virtual schools continued to grow, leading to modest net enrollment increases. The fact that there was any growth at all prior to the pandemic was surprising, since evidence on outcomes was predominately negative over the previous decade.

[i]The authors wish to recognize Ana Laura Vasquez-Quino for assistance in collecting data from Alaska and Alabama.

The COVID-19 pandemic that started affecting primary and secondary schools in the spring of 2020 ended up having a dramatic impact on the virtual school sector. Enrollments in full-time virtual schools nearly doubled, and the number of full-time virtual schools that met our inclusion criteria for our national inventory increased from 477 in 2019-20 to 726 in 2021-22.[3] Charter schools accounted for a net increase of only four new virtual schools, while school districts accounted for 245 new full-time virtual schools. It is important to note that districts and charter schools around the country were switching to virtual instruction for extended periods of time during the pandemic. These changes were not permanent, so these schools did not become classified as full-time virtual schools. Instead, they switched to virtual instruction when required by education officials, and when possible, they returned to classroom-based instruction.

This report focuses largely on data for 2021-22, which is the most recent year from which we could obtain relatively complete data. Trends and comparisons are made with data from earlier years to provide context. The report details student demographics, key school characteristics, school performance, and sector growth. Research questions include:

- How many full-time virtual 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 students enrolled in virtual schools differ from those enrolled in brick-and-mortar schools?
- How do virtual schools perform in terms of school performance ratings and graduation rates?

Student demographics reported include grade level, race-ethnicity, sex, and socioeconomic status (measured by the percentage of students qualifying for free and reduced-price lunch). Data on school performance includes state-assigned school performance ratings and graduation rates; when possible, comparisons are made with national norms. Also included are data on student-teacher ratios.

The findings presented in this report are based on publicly available data for the 2021-22 school year. Data came primarily from state education agencies, sometimes supplemented by information from school and district websites. Data on student demographics and school characteristics came from the National Center for Education Statistics (NCES). Please note that Appendix I-A contains details about methods, data sources, and limitations.

Growth and Current Scope of Full-Time 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. This report will only focus on full-time virtual schools. Full-time virtual schools are especially important to track because they are the fastest growing form of school choice. They are expected to deliver a full education and are supported with the same or similar funding formula as brick-and-mortar charter schools in most states.

Although these schools still account for a relatively small portion of the overall school choice options in the U.S., they constitute a fast-growing enrollment option (as of 2021-22, virtual schools account for 1.4% of the nation's public school students). As initial evidence suggests, the pandemic that struck in spring 2020 resulted in a very large growth in this sector. We have initial data that indicates that enrollments in full-time virtual schools dropped after the pandemic, but it is still too early to determine if these schools will revert to enrollment levels prior to the pandemic.

Virtual schools overlap with two other choice options: homeschooling and charter schools. For some students, the virtual school experience supplements the homeschool experience. In addition, 58.4% of virtual school students are enrolled in virtual charter schools, making them both virtual school students and charter school students. Appendix I-B contains charts that depict the number of virtual schools and students by state. During the 2021-22 school year, 35 states had full-time virtual schools that met our criteria for inclusion.[4]

A total of 726 full-time virtual schools met the selection criteria for the 2021-22 school year, 249 more than existed in 2019-20, which was the reference year for our previous report. Between 2019-20 (pre-pandemic) and 2020-21, enrollment in full-time virtual schools nearly doubled, increasing from 332,379 students to 643,930 a year later. In the following year (between 2020-21 and 2021-22), total enrollments in full-time virtual schools declined by 65,000 students. This drop in enrollments occurred even though the net number of full-time virtual schools continued to grow with the addition of 74 more virtual schools, which were largely smaller district virtual schools. In 2019-20, there were 477 virtual schools, and this increased to 653 in 2020-21 and 726 virtual schools in 2021-22. This sharp decrease in enrollments can be attributed to the reduced impact of the pandemic and the eagerness for families to have their children back in brick-and-mortar schools.

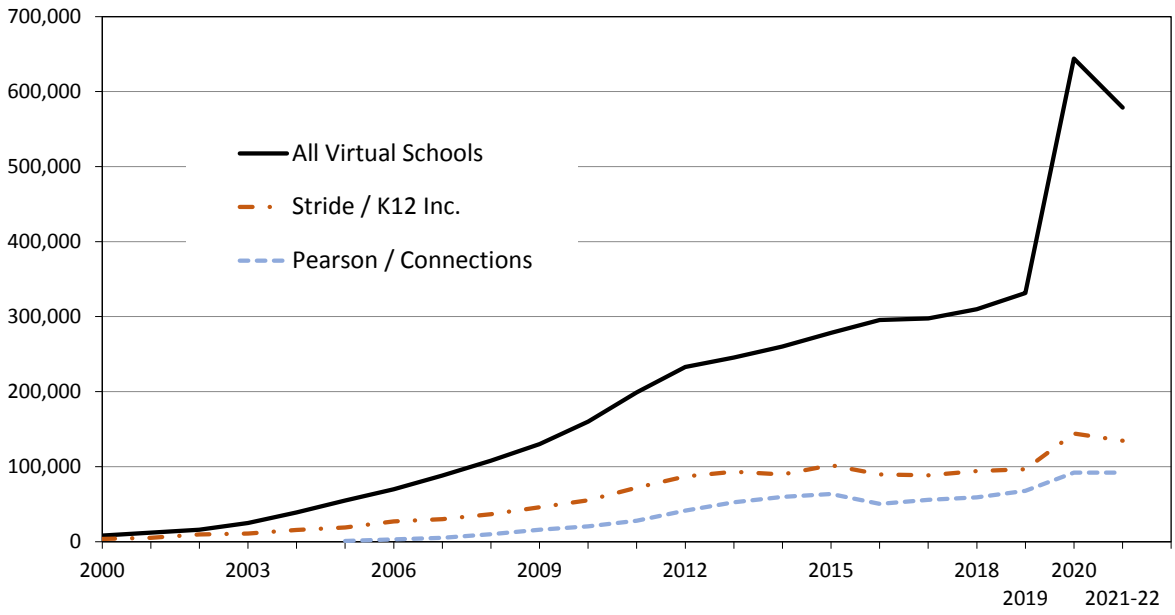
Figure 1 illustrates the estimated enrollment growth in full-time virtual students over the last two decades.[5] Figure 1 also illustrates the proportion of students in schools operated by the two largest for-profit Education Management Organizations (EMOs), Stride/K12 Inc. and Pearson/Connections. Stride/K12 Inc. schools accounted for 23% of all virtual school enrollments. Pearson/Connections schools accounted for 16% of all enrollments. Overall, the market share of these two large companies has been decreasing as districts open more of their own virtual schools. Nevertheless, except for a small decrease between 2020-21 and 2021-22, these two key corporate, for-profit players appear to be consistently growing both in the number of schools they operate or work with and the number of students they enroll.

Figure 1 fluctuations for these two for-profit EMOs likely reflect shifts in their relationships with schools or, in some cases, masking relationships entirely by using intermediary nonprofit organizations. For example, these corporations as well as others sometimes shift

their relationship with schools from "operators" with executive control over the school (i.e., EMOs) to "vendors." As vendors, the private companies provide specific services or products, primarily access to the EMO's learning platform and curriculum.

As Figure 1 illustrates, there was an extremely large expansion of full-time virtual school students between the 2019-20 school year and the 2020-21 school year. The COVID-19 pandemic started to impact schools in the spring of 2020, with many schools temporarily switching to online instruction or offering families the option to attend an online program or school to finish that school year. Over the summer of 2020, school districts went into action, and 181 new full-time virtual schools were established, and 64 more were added in 2021. Most of these were district-operated and, to a lesser extent, charter schools were creating new virtual schools. We identified more than 70 schools that were previously identified as blended learning schools that had become full-time virtual schools in 2020 and 2021. The large for-profit charter virtual school operators did not see the number of their schools change much, although they did expand their enrollments dramatically as families sought alternatives to their in-person public schools that either were staying with face-to-face instruction or communicated uncertain plans for the 2021-22 school year.

Figure 1. Enrollment Trends in Full-Time Virtual Schools



Between 2019-20 (pre-pandemic) and 2020-21, enrollment in full-time virtual schools nearly doubled, increasing from 332,379 students to 643,930 a year later (an increase of 332,379 students). Given the rapid increase in enrollment during the pandemic, it is interesting to note that as the pandemic eased up between 2020-21 and 2021-22 school years, enrollments in full-time virtual schools declined by 65,000 students. This drop in enrollments occurred even though the net number of full-time virtual schools continued to grow.

Between 2019-20 and 2020-21, Stride/K12 Inc. added nearly 48,000 students, and Pear-

son/Connections added just over 24,000 students. Of the drop in net enrollments in virtual schools in 2021-22 mentioned above, Stride/K12 Inc. accounted for a decrease of nearly 10,000 students.

Before the pandemic, districts were adding most to the new pool of full-time virtual schools, although the district schools tended to be small relative to virtual charter schools (see Table 1). During the pandemic, districts had a net increase of 242 additional full-time virtual schools, although these still tended to be relatively small schools in enrollment. In total, district virtual schools enrolled an additional 160,000 students during the pandemic, while charter virtual schools added 86,000 students.

In 2021-22, 484 district virtual schools and 242 charter virtual schools were operating. District schools now account for two thirds of all virtual schools, but their share of enrollments is only 41.6%; charters account for 58.4%. Both continue to increase average school size. District average enrollment per school is 498, while charters average 1,396. A possible explanation is that district schools typically serve smaller targeted populations within district boundaries, while charter virtual schools are more likely to target statewide markets. Another possible explanation is that for-profit companies, which prioritize larger school sizes to maximize profit, rarely operate district virtual schools.

Table 1. Distribution of Virtual Schools and Students Across District and Charter Sectors, 2021-22

	Total Number of Schools in 2021-22	Percent of All Schools	Students	Percent of All Enrollment	Average Enrollment Per School
District	484	66.67%	240,841	41.62%	498
Charter	242	33.33%	337,818	58.38%	1,396
Total for All Virtual Schools	726	100.00%	578,659	100.00%	797

Private EMOs operated 32% of all full-time virtual schools, accounting for 52% of enrollment (see Table 2). Nonprofit EMOs gained 1 percent of the market share since 2019-20, and independent virtual schools (those that have no EMO) increased their market share in that time period by 11%. Although charter schools were much more likely than district schools to be operated by a for-profit EMO, 75 district schools were operated by for-profits, primarily Stride/K12 Inc.

Stride/K12 Inc. remains the largest EMO in this sector; in 2021-22, it operated 78 full-time virtual schools enrolling 134,525 students, an increase of nearly 38,000 students during the last two years. Pearson/Connections, the second largest for-profit EMO, operated 46 virtual schools enrolling 92,102 students, an increase of some 23,000 students since 2019-20. With six full-time virtual schools, EPIC Charter Schools, largely concentrated in Oklahoma, nearly doubled their enrollment to 44,000 students between 2019-20 and 2020-21; the following year, their enrollment dropped by 15,000 students.

It is important to note that this report's data on private operators likely underrepresents the role of for-profit EMOs. In addition to operating some schools as EMOs, Stride/K12 Inc. and Pearson/Connections also have vendor relationships with scores of others. When an EMO operates a school, it has executive control of the school, including curriculum and programs, as well as the hiring of administrators and teachers. In vendor relationships, the private company typically leases its learning platform and curriculum to the school, which retains management of all other aspects, including hiring teachers and administrators. In 2018, California adopted legislation that restricted for-profit EMO management of public schools. However, close examination of management contracts reveal only minor changes in the terms of the management arrangements and, in many cases, the use of nonprofit intermediary organizations have allowed for-profit EMOs to continue doing business as they did before the legislation.

Aside from Stride/K12 Inc. and Pearson/Connections, several other for-profit EMOs have entered the marketplace, although they still remain relatively small. Given the relatively lucrative circumstances[6] under which full-time virtual schools can operate, however, it is likely that still more for-profit EMOs will expand their business models to include full-time virtual schools growth.

Table 2. Distribution of Virtual Schools and Students by Operator Status, 2021-22

	Total Number of Schools in 2021-22	Percent of All Schools	Students	Percent of All Enrollment	Average Enrollment Per School
Independent	494	68.0%	277,593	48.0%	562
Nonprofit EMO	52	7.2%	34,096	5.9%	656
For-profit EMO	180	24.8%	266,970	46.1%	1,483
Total for All Virtual Schools	726	100.0%	578,659	100.0%	797

Variance in the for-profit sector's enrollments is great, with some for-profit EMOs operating schools with more than 10,000 students. The largest school in 2021-22 was Commonwealth Charter Academy in Pennysvlania with 18,087 students. The Ohio Virtual School, was next largest with 16,161 students. Pennsylvania and Texas each had two virtual schools with more than 10,000 students—and one enrolling more than 18,000 students in a single school unit. Not surpringly, 70% of the full-time virtual schools with more than 5,000 students were organized as for-profit charter schools.

Nonprofit EMOs operated only 52 virtual schools in 2021-22 and increased enrollments by 18,000 students since 2019-20. None are very large or control more than a handful of schools. The largest are Learning Matters Educational Group (seven schools), Idaho Virtual

Academy (four schools), Compass Charter schools (three schools), and Virtual Education Services Association (three schools).

Independent virtual schools which have no private EMO also grew in the last two years, with an addition of 200 schools and an increase of just under 158,000 students. Independent virtual schools averaged 562 students, nonprofit EMO-operated schools averaged 656 students, and—in stark contrast—for-profit EMO-operated schools averaged 1,483 students.

Distribution of Virtual Schools by State

A total of 35 states have full-time virtual schools that met our selection criteria. See Appendix I-B with the list of states and charts that illustrate the number of virtual schools by state and the number of students enrolled in virtual schools. Michigan has the most full-time virtual schools with 81. Perhaps more relevant is the actual number of students enrolled in tIhese schools. Some states only need a few of these schools that enroll students from all districts in the state. California has the most students enrolled in full-time virtual schools, with just under 60,000. Pennsyvlania is close behind with 57,800 students. States with between 30,000 and 50,000 students include Texas, Arizona, Oklahoma, Ohio, and Michigan.

Analyses Based on NCES Indicators Related to Virtual Instruction

A separate analysis of data from the National Center for Education Statistics (NCES) was undertaken to verify the trends in virtual school enrollments observed during the pandemic. The NCES uses a unique classification of schools to distinguish the extent to which they use virtual instruction. One category is for exclusively virtual schools which they label "Full-Virtual." Next, they identify schools that are primarily virtual but have some supplemental instruction that occurs face-to-face with teachers in a school building; this is referred to as "FaceVirtual." The third category is "SuppVirtual" which refers to schools that are mostly provide in-person instruction, although they have supplemental learning activities or instruction that can take place virtually. The last category is "NotVirtual" which refers to the largest group of schools in the country, where students receive their full education in brick-and-mortar school buildings.

The overall number of FullVirtual schools reported by the NCES differs from the number of schools we classify as full-time virtual. Our dataset has been built and expanded over the past decade. Each time we update our national inventory of virtual schools, we carefully vet each school and assign the full-time virtual designation only when schools met our criteria for inclusion (see Appendix I-A for details about our selection criteria and methods). The NCES relies on reporting from states for their virtual status designations and this data appears to be unaudited. It is also important to note that the NCES results summarized in Tables 3 and 4 as well and Figure 2 exclude data from California.[7]

Table 3. Number of Public Schools by Virtual School Status (2018-10 to 2021-22)

Year	Total Public Schools	FullVirtual		FaceVirtual		SuppVirtual		NotVirtual		Not Reported or Missing	
		#	%	#	%	#	%	#	%	#	%
2018	99,911	675	0.7%	386	0.4%	7,503	7.5%	91,004	91.1%	343	0.3%
2019	99,624	691	0.7%	381	0.4%	8,333	8.4%	79,825	80.1%	10,394	10.4%
2020	99,763	818	0.8%	554	0.6%	23,363	24.4%	49,156	49.3%	24,872	24.9%
2021	100,425	1,093	1.1%	332	0.3%	16,834	16.8%	62,707	62.4%	19,459	19.4%

Table 3 outlines the number of schools in the U.S. (excluding California) according to their NCES-designated virtual school status, and Table 4 provides a similar breakout for the number of students enrolled. The figures show an increase from 691 FullVirtual schools in 2019-20 growing rapidly to 1,093 in 2021-22. Table 4 contains enrollment data broken out by NCES virtual codes. As can be seen, student enrollment in FullVirtual schools nearly doubled during the pandemic (2019-20 to 2021-22); this finding mirrors what we found in our dataset.

Table 4. Number of Students by Virtual School Status (2018-2021)

Year	Total Public Students*	FullVirtual		FaceVirtual		SuppVirtual		NotVirtual		Not Reported or Missing	
		#	%	#	%	#	%	#	%	#	%
2018	50,751,092	289,624	0.6%	126,735	0.2%	4,236,824	8.3%	46,082,166	90.8%	15,743	0.0%
2019	50,833,994	293,717	0.6%	142,378	0.3%	4,638,209	9.1%	39,756,919	78.2%	6,002,771	11.8%
2020	49,057,632	593,778	1.2%	247,661	0.5%	11,940,890	24.3%	22,406,541	45.7%	13,868,762	28.3%
2021	49,446,928	566,344	1.1%	106,219	0.2%	8,273,507	16.7%	29,238,797	59.1%	11,262,061	22.8%

*Includes all public primary and secondary school students in the U.S., excluding California.

Figure 2. Shift Away From "NotVirtual" Schools During Pandemic (Percentage of All Public Schools in the U.S., Excluding California)

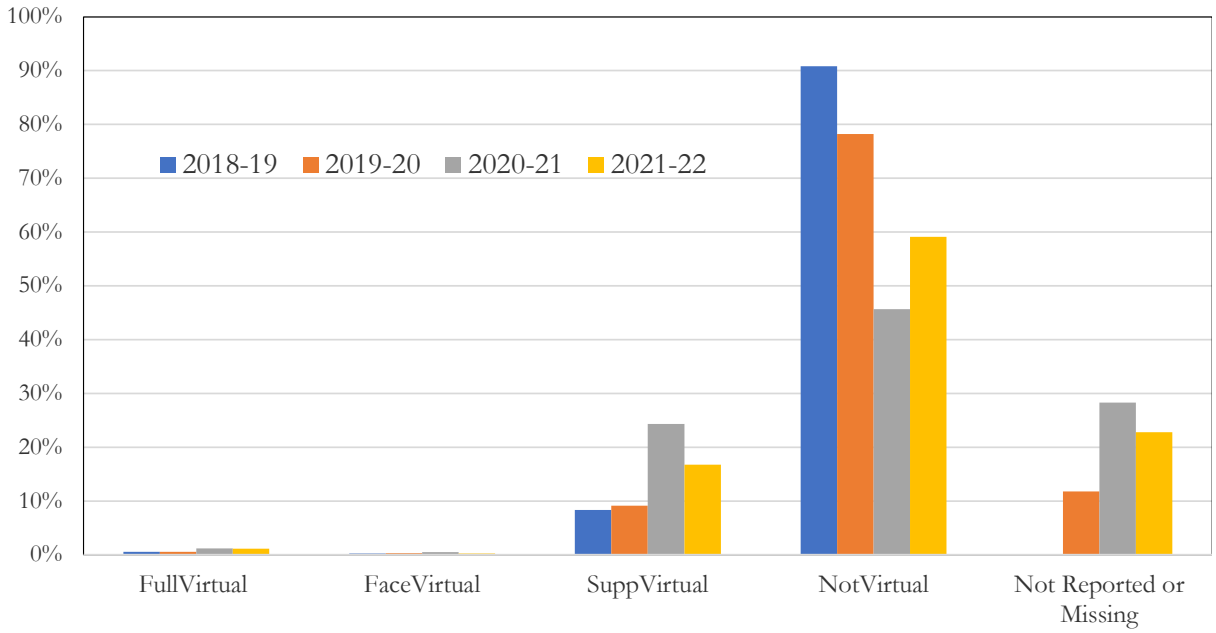


Figure 2 illustrates enrollment trends based on the NCES virtual codes. While the growth in full-time virtual schools is quite large, as a percentage of all public schools in the country the expansion of virtual schools was hardly noticeable. What is striking from the results in Figure 2 is that the percentage of schools classified as "NotVirtual" dropped from just over 90% in 2018-19 to 45.7% in 2020-21, and then came back up to 59.1 in 2021-22. Most of the shift away from the "NotVirtual" schools was a shift to schools using virtual means to supplement their instruction. Also, the number of schools in the country that either did not report their school's "virtual status" or had missing data on this variable increased dramatically, with 11% in 2019-20, racing up to 28.3% in 2020-21 and 22.8% in 2021-22. The data on schools either having missing data or not reporting their virtual status speaks to the chaos that affected primary and secondary schools across the country during the pandemic.

Student Demographics

Data on demographics came primarily from state education agencies and the National Center for Education Statistics for the 2021-22 school year.

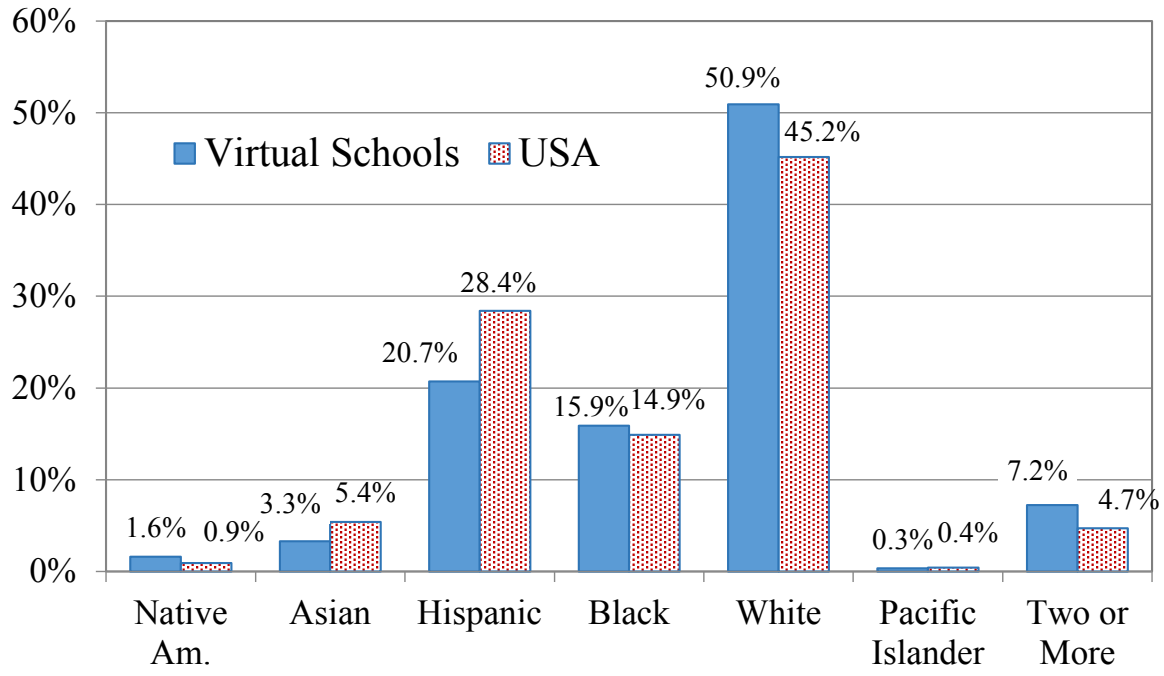
Race-Ethnicity

Data on race/ethnicity was available for 726 virtual schools. In prior years, the proportion

of minority students in virtual schools had slowly increased by a few percentage points each year. Over the last two years, however, there was a 6% increase in the proportion of Black students, a 4% increase in the proportion of Hispanic students, and a 2% increase in the proportion of Asian students. While the number of students in all racial groups increased during the pandemic, the proportion of White students relative to the overall enrollments in virtual schools dropped by 6%, and the proportion of Native Americans dropped by 1%.

The proportion of virtual school students who were White-Non-Hispanic was 45.2%, which is identical to the national norm (see Figure 3). Hispanic and Asian children were underrepresented relative to the national public school population, while other race/ethnicity groups are relatively similar.

Figure 3. Race/Ethnicity of Students in Virtual Schools Compared with National Averages, 2021-22



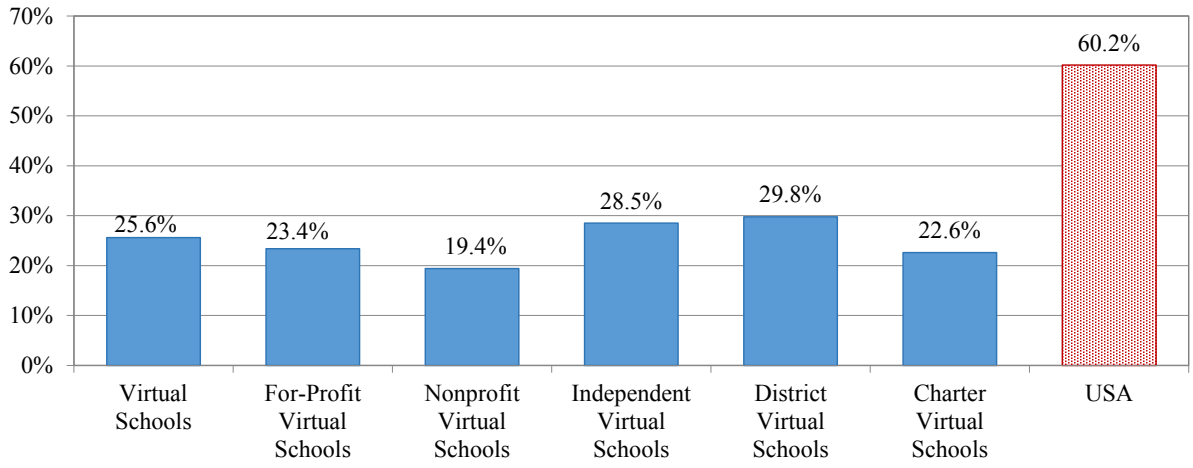
Free and Reduced-Price Lunch

As illustrated in Figure 4, data on students qualifying for free or reduced-price lunch (FRL) was available for 474 virtual schools. Among students in those schools, 25.6% met FRL requirements—34.6 percentage points lower than the national average of 60.2%. Charter schools had a much lower percentage (22.6%) than districts (29.8%); for-profits had a slightly higher percentage (23.4%) than nonprofits (19.4%).

Before the pandemic the proportion of students qualifying for free or reduced-price lunch in full-time virtual schools was only slightly lower than the national average. With the rapid expansion of new virtual schools and near doubling of enrollment during the pandemic, we can now see signs that lower-income students who qualify for free and reduced-price lunch

were much less likely to switch to a virtual school. This drop in the proportion of virtual school students qualifying for FRL occurred across all categories outlined in Figure 3.

Figure 4. Students Qualifying for Free and Reduced-Priced Lunch, 2021-22



Sex

While the population in the nation's public schools is slightly weighted toward males (51.3% males and 48.7% females), the 2021-22 student population in virtual schools (726 schools with data) was skewed toward females: 51.9% females and 48.1% males. That gap of 3.8 percentage points is actually lower than pre-pandemic in virtual schools when females comprised 53.4% of all virtual school students. These ratios remained largely the same across different types of virtual schools, although females were slightly more prevalent in charter schools than district schools.

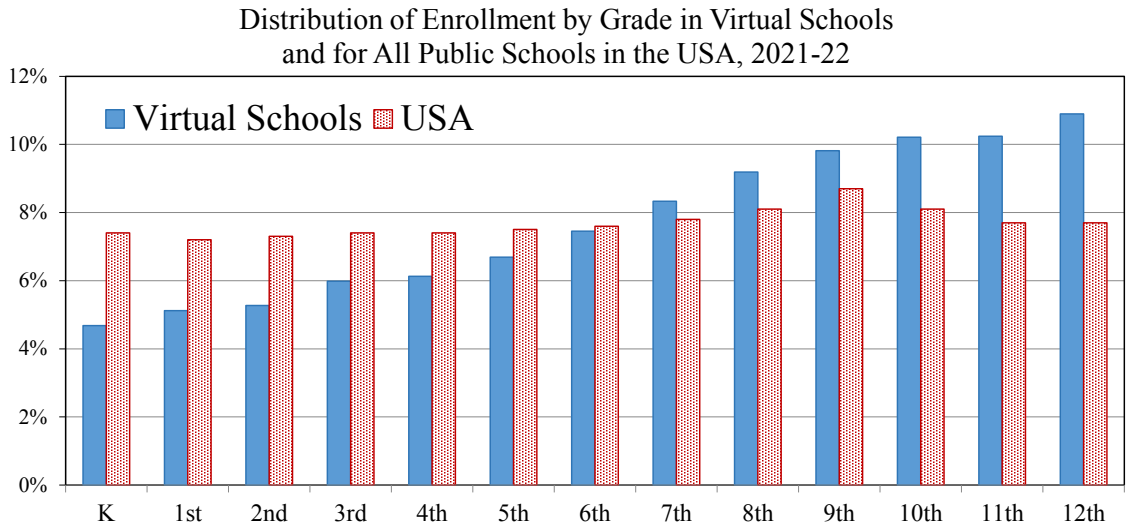
Enrollment by Grade Level

To illustrate the distribution of students in virtual schools as accurately as possible, Figure 5 details actual student enrollment by grade for 2021-22; comparisons were based on national averages. A disproportionate number of virtual school students 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 a bit surprising because the lower cost of educating at the primary and lower secondary level has made those options more popular in brick-and-mortar charters, while in general, virtual schools more often serve upper secondary level options.

District-operated virtual schools served more students at the upper secondary level than charter schools. For-profit EMOs, unlike nonprofit EMOs and independent schools, served comparatively fewer upper-level students. And most of the for-profit EMOs also showed a steep enrollment drop after Grade 9. In contrast, many district-operated virtual schools serve only students in Grades 11 and 12, since these schools were originally based on credit recovery programs. It was noteworthy that for-profit-operated virtual schools had a more pronounced drop-off in enrollments after grade 10. This decline in the for-profit grade cohorts may be related to their lower graduation rates.

During the last two years, which overlap with the COVID-19 pandemic, it is possible to see that enrollments in virtual schools closed a few percentage points between the lower elementary grades and the upper secondary grades.

Figure 5. Enrollment by Grade Level for Virtual Schools and U.S., 2021-22



Student-Teacher Ratios

Far more schools reported demographic data for their students than reported student-teacher ratios or metrics that allowed for calculating them. However, several states did report data on student-teacher ratios at the school level, allowing us to calculate means for them by using 2021-22 enrollment as a weight. Table 5 contains key indicators related to student-teacher ratios in full-time virtual schools. While the average ratio was approximately 14.8 students per teacher in the nation's public schools, virtual schools reported 24.4 students per teacher. Even so, this represents a reduction since our previous report, when virtual schools had 27 students per teacher on average.

Table 5. Student-Teacher Ratios in Virtual Schools, 2021-22

	Number of Schools with Data	Mean Students per Teacher	Standard Deviation
All Virtual Schools	577	24.4	47.0
Independent	393	21.9	47.4
Nonprofit	34	24.9	31.8
For-Profit	150	27.4	49.1
District	369	22.9	50.1
Charter	208	25.5	40.9
National Average[8]		14.8	

Over the past two years, district-run virtual schools have expanded the most, resulting in a reduced student-teacher ratio in the district virtual schools (this figure dropped from 27.7 students per teacher in 2019-20 to 22.9 in 2021-22). The likely explanation for this drop in student-to-teacher ratio in district virtual schools is that these schools are less likely to be operated by for-profit EMOs, and they are less likely to use asynchronous student self-guided instruction. Charter schools had a higher student-teacher ratio with 25.5 students per teacher. Among virtual schools, independents had a somewhat lower average student-teacher ratio (21.9) than nonprofits (24.9) and for-profits (27.4). The Standard Deviation (SD) for all groups is very large, which indicates considerable variations across schools within each of the categories we designated.

Overall, student-teacher ratios in virtual schools continue to improve but still lag well behind the national average of 14.8 students. This has implications for school performance, which is examined in the next section.

Generally, poor student-teacher ratios will likely continue to perpetuate poor performance indicators in virtual schools. In most states, the funding formula for virtual schools is based on the funding model for brick-and-mortar charter schools. Virtual schools have obvious cost advantages relative to brick-and-mortar schools (consider for example, facilities, transportation, sports, extracurricular activities, etc.). Given these cost advantages, virtual schools should be able to afford more teachers and more support for students to ensure they learn and develop. As evidence in the next section indicates, the students in virtual schools need more support and instruction, because these schools continue a long and consistent record of very poor performance.

School Performance Findings

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

Evidence on the performance of virtual schools as measured by school- or student-specific outcomes has been consistently negative ever since data on the outcomes for these schools have been summarized and reported. The first decade of the new millennium provided little research into full-time virtual school student achievement at the K-12 level, although the results were universally negative and indicated that students in virtual schools were learning less and falling behind. A review of early evidence on the performance of virtual schools is available in Miron and Urschel (2012)[9]. Research over the past dozen years, particularly the national reports released by NEPC, has verified that the performance of full-time virtual schools lags far behind, and the results are consistent from year to year with only occasional signs of small improvements. The findings in this report confirm what has long been apparent; the performance of full-time virtual schools is dramatically subpar.

Methodology

State education agencies provide a metric for school performance when they assign school performance ratings, typically on school report cards. We focus only on school report cards or state-assigned school performance measures, because they provide a more holistic picture compared with aggregate scores on state assessments.. A second and more compelling reason is that over the last five 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 such actions, test results were no longer comparable over time. Moreover, some states now report limited or no school performance data from state assessments.

Gaps in reporting of school performance ratings are due to several factors. Due to the current flux in accountability systems resulting from new requirements under the 2015 Every Student Succeeds Act (ESSA) and from flexibility waivers and extensions granted under the Elementary and Secondary Education Act (ESEA), a number of states have suspended their accountability systems as they finalize new formats and transition to new standards and state tests. Several states offer some school report card data but are not currently assigning an overall performance rating; others have no current school report card data and offer no explanation. Another reason is that waivers granted by states during the COVID-19 pandemic resulted in no school performance measures being reported or released. As a result, school performance ratings for virtual schools were available for only 18 of the 35 states included in this report.

State School Performance Ratings

Current report card data is comparable to our last report, although it still suffers from the same limitation: a lack of available data for all states. Further, some states also lack details about what measures or indicators are used to determine school performance. While annual school report cards and school performance ratings often include multiple measures varying from state to state, they tend to include student performance in math and English/language arts, graduation rates, and achievement gaps. Increasingly, 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. But even as the type, number, and weighting of such indicators in formulas to determine overall school performance ratings vary across states, such ratings do reflect an individual state's educational values. Therefore, they reasonably represent an individual school's performance relevant to state expectations.

For the purposes of this report, a coding system was used to aggregate ratings across the 18 states with school performance data. Each received one of two possible ratings: "academically acceptable" or "academically unacceptable." An acceptable rating means the school is, generally speaking, meeting at least the minimum requirements of that state's performance expectations; unacceptable would be the opposite in that these performance expectations are

not being met. Due to the impacts of COVID-19, many states opted not to offer summative performance ratings for the 2021-22 school year. These include Alaska, California, Florida, Georgia, Idaho, Indiana, Kansas, Kentucky, Massachusettes, Maine, Minnesota, Montana, Nebraska, New Hampshire, New Mexico, Nevada, and Ohio.

When states did include overall ratings, state agencies may have provided guidance about how to interpret them. We also sought to interpret state ratings based on guidelines from the Every Student Succeds Act (ESEA).[10] It is important to note that states' respective standards and expectations vary, with some states setting high standards and others being more lenient. In Texas, for example, schools are given a letter grade from A to F based on school performance measures. Guidance from the state education agency indicates that schools that receive a grade from A to D have acceptable performace, and only schools with an F are considered not be meeting expectations.

School performance ratings for virtual schools were available for only a portion of the states included in this year's report, either for reasons noted above or because state ratings for 2021-2022 had not been released in time for this report's publication. Of the 726 virtual schools included in this inventory, only 296 had school performance ratings assigned by their respective state education agency in 2021-22. That means a full 430 schools did not have a school performance rating assigned, and most of these schools were located in states that simply did not report this outcome data in 2021-22. If we consider only states that did report data, there were 114 schools that we should have expected to have a performance rating but for some unexplained reason, they did not.

Because the 2021-22 results were relatively incomplete, we also did a second analysis that considered the school rating for the most recent year available. We limited this to the last three years and found that the total number of schools with a rating jumped from 296 to 380. Generally, as we expanded the analyses to include more virtual schools, the results became more negative for virtual schools. Table 6 highlights key results in terms of school performance ratings for 2021-22 and for the most recent year that schools had data available.

Overall school performance ratings for 2021-22 are based on report cards. Performance ratings were potentially available for half of the full-time virtual schools. Fewer virtual schools received acceptable state ratings for 2021-22 compared to 2019-20, with the percentage for virtual schools dropping slightly from 42.8% to 41.2%. Of the 74 for-profit EMO virtual schools rated, 43.2% were found acceptable. Nonprofit EMO virtual schools had few schools with a rating but 88.9% had acceptable ratings. Independent virtual schools had 213 schools and 38.5% of these had acceptable ratings (see Table 6).

Table 6. Percentage of Virtual Schools with Acceptable School Performance Ratings, 2021-22 and Most Recent Year of Data

	2021-22				Most Recent Year			
	Acceptable		Unacceptable		Acceptable		Unacceptable	
	N	Percent	N	Percent	N	Percent	N	Percent
All Full-Time Virtual	122	41.2%	174	58.8%	162	42.6%	218	57.4%
Independent	82	38.5%	131	61.5%	112	42.6%	151	57.4%
Nonprofit	8	88.9%	1	11.1%	12	80.0%	3	20.0%
For-Profit	32	43.2%	42	56.8%	38	37.3%	64	62.7%
Charter	44	52.4%	40	47.6%	57	47.9%	62	52.1%
District	78	36.8%	134	58.8%	105	40.2%	156	59.8%

Note. The total number of virtual schools with ratings in 2021-22 was 296. The total number of schools that had at least one performance rating in the last three years was 380.

While the left-hand columns in Table 6 contain findings from 2021-22, we also tallied ratings based on the most recent year in which there was a performance rating (see the right-hand side of Table 6). That means that if a school did not have a performance rating in 2021-22, we included the rating from the most recent year prior to 2021-22. This approach allowed us to gather performance ratings on twice as many schools.

Graduation Rates

Four-year graduation rates were obtained from state sources and checked to ensure a common measurement standard of students graduating from high school within four years after entering ninth grade. Percentages include all types of diplomas, brick-and-mortar and otherwise, although states may specify different rates for different types of diplomas.

Some states did not issue report cards due to the coronavirus pandemic and did not have graduation data available for 2021-22. In states with available graduation rates, some schools' rates were masked because of low enrollment; other relatively new schools may not have had a complete 9-12 student cohort. And, of course, many schools served only grades below the high school level. Of the 726 virtual schools in the inventory, information on graduation rates was available in 2021-22 for a third of the schools. In order to sample a larger number of schools, we also created a variable for the most recent year with graduation rate data. If schools did not have graduation rate data in 2021-22, then we included the most recent graduation rate data available going back as far as 2019-20. This analysis allowed us to obtain an indicator from an additional 181 virtual schools. Table 7 includes data for both 2021-22 and the most recent year for which graduation rate was available.

As Table 7 illustrates, on-time graduation rates of 65.1% for 2021-22 (N=228) and 61.9% for most recent year available (N=409) are noticeably lower than the national average of 86.5%.

Nevertheless, virtual schools have experienced improvements of close to five percentage points since 2019-20. M`uch of this improvement appears to be connected with the net addition of 242 additional district virtual schools in the last two years.

Table 7. Four-Year Graduation Rates, 2021-22

	2021-22		Most Recent Year	
	Number of Schools with Data	Graduation Rate	Number of Schools with Data	Graduation Rate
All Virtual Schools	228	65.1%	409	61.9%
Independent Virtual	165	67.1%	266	62.4%
Nonprofit Virtual	10	55.4%	32	55.4%
For-Profit Virtual	53	64.4%	111	62.2%
District Virtual	152	68.8%	227	66.7%
Charter Virtual	76	61.4%	182	59.4%
National Average[11]		86.5%		86.5%

Despite modest improvement in recent years, 2021-22 graduation rates across all subgroups of virtual schools are poor compared to the 86.5% national average. District-operated schools reported higher graduation rates than charter schools for virtual (68.8% graduation rate compared with 61.4% for charter virtual schools). Independently managed virtual schools performed slightly better than virtual schools with a private EMO. Rates in for-profit and nonprofit virtual schools for 2021-22 were 64.4% and 55.4%, respectively.

Recommendations

Full-time virtual schools as they are currently designed do not show promise. Findings in this report reconfirm what we have seen since 2012; the overall performance of full-time virtual schools remains poor with little substantive improvement evident over time. Moreover, their continued expansion undermines the overall education system in two ways. First, most students who choose these schools fare poorly in terms of measurable learning. And second, the reforms redirect an increasing portion of the public resources away from brick-and-mortar schools that perform better.

The prevalent model used today for virtual schools was established by the large for-profit EMOs. This corporate model has generally been adapted by other providers, including some districts. This model does not work. It is failing our children and siphoning off limited taxpayer resources for education. It is time for policymakers to engage and support a comprehensive redesign of full-time virtual schools. Developing a new model for virtual schools needs to be based on evidence and involve input from scholars and practitioners who were not at the table when the dominant model was created. If policymakers are willing to engage and support redesign of these schools, it is possible that the future for virtual schooling may be more promising.

The COVID-19 pandemic had a substantial and negative impact on primary and secondary schools across the nation. This study documents not only a large shift toward full-time virtual schools between the 2019-20 and 2020-21 school years, but also a shift in brick-and-mortar schools using more virtual instruction to supplement classroom-based instruction and to provide an alternative means of delivering instruction during the most challenging months of the pandemic. Early signs are that many families are returning to brick-and-mortar schools from the full-time virtual schools they chose during the pandemic. However, work, shopping, and social engagement changed during the pandemic, and so too has schooling. An often-heard expression related to the impact of the pandemic is, "There is no going back to normal"; instead we need to recognize how things have changed and consider a new normal. While this report has focused largely on full-time virtual schools, it is important that changes in brick-and-mortar schools are followed. New research and evaluations need to examine districts' efforts to use virtual instruction to supplement classroom-based instruction.

In light of current evidence that full-time virtual schools continue performing poorly, we recommend that policymakers:

- Require federal and state education agencies to accurately identify and monitor full-time virtual schools, remedying gaps in information transparency on performance measures and accountability.
- Ensure and enforce sanctions for virtual schools performing inadequately.
- Enhance performance accountability mechanisms to inform funding, renewal, nonrenewal, and revocation decisions.
- Establish requirements for reduced student-to-teacher ratios and regular contact between teachers and online students.
- Slow or stop the growth of virtual schools until substantial academic and/or non-academic outcomes improve and benefits are comparable with brick-and-mortar public schools.
- Sponsor research on full-time virtual schools. This research also needs to focus on alternative models for full-time virtual schools, such as school- or district-run programs, as well as the promising models for blended learning.
- Develop project and grant priorities that document best practices and promising models for virtual schools, including district efforts born of the pandemic. Promote cross-sector collaborations and partnerships to strengthen professional development for teachers and the quality and rigor of students' online learning experiences.
- Convene events with scholars, practitioners, representatives from state and federal education agencies, and other policymakers to carefully design a model for full-time virtual schools that can work. Such a model should include finance and oversight mechanisms ensuring that virtual schools focus on the interests of taxpayers and students, not of corporations.

Notes and References Section I

1 The authors will consider requests to obtain or review their 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 March 26, 2021, from https://nepc.colorado.edu/sites/default/files/nepc-rb-k12-miron.pdf

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

Molnar, A. (Ed.), Huerta, L., Shafer, S.R., Barbour, M.K., Miron, G., & Gulosino, C. (2015). *Virtual schools in the U.S. 2015: 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-2015

Miron, G. & Gulosino, C. (2016). *Virtual schools report 2016: Directory and performance review*. Boulder, CO: National Education Policy Center. Retrieved December 4, 2016, from http://nepc.colorado.edu/publication/virtual-schools-annual-2016

Molnar, A. (Ed.), Miron, G., Gulosino, C., Shank, C., Davidson, C., Barbour, M.K., Huerta, L., Shafer, S.R., Rice, J.K., & Nitkin, D. (2017). *Virtual schools report 2017.* Boulder, CO: National Education Policy Center. Retrieved June 16, 2017, from http://nepc.colorado.edu/publication/virtual-schools-annual-2017

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

Molnar, A., (Ed.), Miron, G., Elgeberi, N., Barbour, M.K., Huerta, L., Shafer, S.R., & Rice, J.K. (2019). *Virtual schools in the U.S. 2019*. Boulder, CO: National Education Policy Center. Retrieved March 26, 2021 from http://nepc.colorado.edu/publication/virtual-schools-annual-2019

Molnar, A. (Ed.), Miron, G., Barbour, M.K., Huerta, L., Shafer, S.R., Rice, J.K., Glover, A., Browning, N., Hagle, S., & Boninger, F. (2021). *Virtual schools in the U.S. 2021.* Boulder, CO: National Education Policy Center. Retrieved March 21, 2023, from http://nepc.colorado.edu/publication/virtual-schools-annual-2021

3 Only public primary and secondary schools are included. Programs within schools and districts are excluded. Each included school must have a unique school or building ID assigned to it. Finally, only schools with 10 or more students were included.

4 Beyond the 35 states with full-time virtual schools, some states also allow other virtual education options, in several alternative formats such as individual online classes, or supplemental online coursework, as full-time blended models. These were beyond the scope of this research. Further, virtual programs as well as individual class innovations that occur within districts and brick-and-mortar schools are also excluded from this study because they are not classified as “schools.”

5 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.

6 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 April 23, 2023, from http://www.pressherald.com/news/virtual-schools-in-maine_2012-09-02.html

7 Although California was excluded from the NCES summary, we did separately examine similar virtual classification used by the California Department of Education. Specfically, we examined California data for 2019-20 and 2021-22 and found a similar trend for what is demonstrated in the NCES summary which is illustrated in Tables 3 and 4, as well as Figure 2.

8 Unless otherwise indicated, national averages or norms are from 2021-22 and sourced from the National Center for Education Statistics.

9 Miron, G. & Urschel, J. (2012). *Understanding and improving full-time virtual schools: 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 http://nepc.colorado.edu/files/nepcrbk12miron.pdf

10 Accoring to ESEA, schools classified on performance measures as Comprehensive Support and Improvement (CSI), Targeted Support and Improvement (TSI), and Additional Targeted Support and Improvement (ATSI) are receiving one of three forms of assistance for low-performing schools. Therefore, we considered schools with ratings that were designated as CSI/TSI/ATSI as having unacceptable school performance ratings. Public schools outside these designations receive general support under ESSA and are considered in good standing and we would classify these as having acceptable school performance ratings.

11 The national average four-year graduation rate is for 2019-20. This data was sourced from the National Center for Education Statistics.

NEPC
NATIONAL EDUCATION POLICY CENTER

Section II

Assessing Virtual Schools After a Global Pandemic: A Reality of Unfulfilled Promise

Bryan Mann
University of Kansas

May 2023

Executive Summary

Proponents of full-time virtual schools—stand-alone schools that offer their entire curriculum and teaching online—have long made extensive claims about their benefits. During the COVID-19 pandemic, these schools have experienced explosive growth. This makes it an opportune time for policymakers to reevaluate the promises against the accumulating evidence.

This literature review examines eight key claims advocates make about virtual schools. These are that virtual schools:

- revolutionize learning with technology;
- improve traditional school districts organized mainly around brick-and-mortar schools;
- promote quality choices;
- offer personalized and flexible instruction;
- provide high-quality and expanded interaction with teachers;
- save at-risk students;
- provide educational access to students with special needs and during emergencies; and
- expand access to educational materials.

The review compares these claims to corresponding academic research and finds that virtual schools, as currently implemented, fall short of fulfilling these promises.

The review only examines full-time virtual schools. It does not include other types of online programs used by brick-and-mortar schools, like blended learning or emergency forms of online instruction implemented during the pandemic. These differ in significant ways from full-time virtual schools. Although blended learning is an important modality and has been explored in prior editions of this series, the focus here is on full-time virtual schools due to the policy discourse and enrollment trends during and following the pandemic.

The driving force behind full-time virtual schools up to now has been a philosophy of technology solutionism operating in an unchecked free market. Virtual schools, this review suggests, are most beneficial when deployed as tools with specific purposes rather than as organizations that prioritize enrollment expansion in a taxpayer-subsidized, free-market system. The way to achieve the optimal scenario for virtual schools is to rely on experts to design inclusive and universally beneficial systems.

Recommendations:

State policymakers can take specific actions to ensure that virtual schools contribute positively to the education landscape:

To support students and families, it is recommended that state policymakers:

- Establish a virtual school student intake screening and encourage parents to reconsider enrollment if a virtual school is not a good fit for their students.
- Fund one-on-one counseling for at-risk students and require the counselor to recommend to the family if virtual schools are inappropriate for the at-risk student.
- Require Individualized Education Plans for all students in virtual schools, akin to those special education students receive. The plans should indicate if students need standardized or personalized programs and then deliver content according to these plans.
- Notify parents and encourage them to withdraw their students from virtual schools if the student is failing to obtain mastery.

To manage virtual school enrollment and performance, it is recommended that state policymakers:

- Require virtual schools to train all incoming students on using their software and programs through in-person training sessions.
- Set maximum teacher-to-pupil ratios for virtual schools that align with statewide averages.
- Require virtual schools to state publicly if their programs are standardized or personalized.
- Require virtual schools to align curricula with state standards and use student mastery as a performance indicator.

- Require virtual school graduation rates to align with statewide averages. If the virtual school fails to meet these benchmarks, assign it probationary status after a year and close after five years of probationary status.
- Require virtual schools to maintain a within-school-year student mobility threshold equal to the mobility rate of brick-and-mortar schools.

To improve system-level capacity and accountability, it is recommended that state policymakers:

- Audit and monitor special education Individualized Education Plans in virtual schools.
- Enact yearly enrollment growth caps for virtual schools.
- Require virtual school field experiences for teacher licensure.
- Fund professional organizations and schools of education to develop teacher training programs for virtual schools and tie these programs to teacher licensure.
- Establish virtual school-specific licensure requirements derived from recognized standards for quality online teaching such as the National Standards for Quality Online Learning.
- Conduct yearly costing-out studies and set statewide virtual school tuition rates in alignment with the actual costs of operating virtual schools.
- Create programs in state education departments that oversee virtual school operations, allowing for implementation and oversight of the preceding recommendations.

NEPC
NATIONAL EDUCATION POLICY CENTER

Section II

Assessing Virtual Schools After a Global Pandemic: A Reality of Unfulfilled Promise

Bryan Mann
University of Kansas

May 2023

Introduction

The COVID-19 pandemic prompted families across the country to transition from in-person to full-time online learning. More than 90% of families in the U.S. reported using some form of distance or online learning during the peak of the crisis.[1] But while the pandemic led to a sudden increase in emergency online learning, virtual schools have existed in the United States since the early 1990s.[2] Despite concerns about educational performance before and during the pandemic[3] and equity issues for learners in virtual schools,[4] the sector continues to expand.[5] Section I of the report shows that virtual school enrollment nearly doubled during the pandemic.

This section of the report assesses the literature on virtual schools[6] and evaluates research on their performance against claims made about them. Given the time virtual schools have had to develop and the recent expansion they have undergone, it is an opportune moment to evaluate their effectiveness. The review shows that even though virtual schools are suitable in certain circumstances, there are significant concerns about their overall quality and accountability. This review examines eight claims about virtual schools and shows the research-based reality of each:

Claim: Full-time virtual schools revolutionize and improve learning with contemporary technologies.
Reality: Virtual schools have not transformed student learning or acted as a beneficial disruptive innovation. In many cases, they have harmed the public education system.

Claim: Competition from virtual schools will efficiently improve traditional school districts organized mainly around brick-and-mortar schools.

Reality: Competition has negatively impacted traditional school districts organized mainly around brick-and-mortar schools, and competitive environments have been inefficient.

Claim: Virtual schools advance parental choice to provide better schooling options for families.
Reality: While choice has expanded, the options available are not necessarily better.

Claim: Virtual schools provide personalized and flexible learning.
Reality: Virtual schools provide flexibility but not personalization.

Claim: Virtual schools provide high-quality instructional support with extended teacher interaction.
Reality: Virtual teachers are undertrained and too overloaded to provide high-quality instruction.

Claim: Virtual schools save students at risk of dropping out of school or with substantial social issues that negatively affect their education.
Reality: Virtual schools are often not appropriate for at-risk students.

Claim: Virtual schools provide educational access to students with special needs and allow for continued schooling in emergency health situations.
Reality: Virtual schools can serve as an emergency educational option, but they struggle to adhere to mandates of the Individuals with Disabilities Education Act (IDEA).

Claim: Virtual schools expand access to educational materials.
Reality: Access becomes irrelevant if students cannot learn and understand the material.

Review of the Literature: Claims Made by Virtual School Proponents vs. Evidence-Based Reality

Claim: Full-time virtual schools revolutionize and improve learning with contemporary technologies.

Virtual school advocates argue that the schools are a transformative force in K–12 education and serve as a "disruptive innovation"[7] that will lead to significant changes in the education landscape.[8] The central claim of the disruptive innovation concept is that when industries encounter a superior product or process, the organizations with the new product or process replace those who fail to adapt. A commonly cited example in this context is how the failure of Blockbuster to adapt to Netflix's superior process for home cinema led to Blockbuster's downfall. Stanford professors Terry Moe and John Chubb allude to this process in their 2009 book, *Liberating Learning: Technology, Politics, and the Future of American Education,* arguing that virtual schools and online learning will change American education and that "the forces of resistance will ultimately be overcome, leading to a transformation of the American school system."[9] The problem with this claim is that the predicted positive disruption has not materialized despite decades of virtual schools, and, despite the hopes

of the disrupters, the lack of disruption is fortunate because virtual school quality has been remarkably poor.

Virtual schools are not a superior product or process to brick-and-mortar schools and families are not enrolling in them on a scale that would lead to disruptive innovation. Research consistently shows that virtual schools produce adverse academic outcomes.[10] Students have not performed well even where virtual schools have seen significant growth.[11] The only study reviewed that found positive effects of virtual schooling was a longitudinal study that followed students over time. The study found that students who persisted in virtual schools for several years, likely due to their unique circumstances, were more likely to have better scores in some academic areas.[12] However, all other research, including a more recent longitudinal study, shows virtual schools have lower academic achievement outcomes for students in years they attended virtual schools compared to when they attended brick-and-mortar schools, including students who moved and who stayed enrolled.[13] Overall, the weight and abundance of research evidence suggests virtual schools fail to promote positive academic achievement outcomes.

The first K–12 virtual school opened more than three decades ago,[14] and the proliferation of virtual schools has been driven by the virtual charter school movement, which began in the late 1990s.[15] Virtual charter schools are virtual schools that rely on statewide charter school policies to govern them, typically drawing state or funding from traditional school districts organized mainly around brick-and-mortar schools. Despite a rise in enrollment in virtual schools over the last 30 years, the enrollment trends do not support the idea of virtual schools being a disruptive innovation, and post-pandemic education goals from an ideological range of stakeholders center on the need for in-person learning.[16]

Virtual schools align with Justin Reich's characterization of technologies that have "failed to disrupt."[17] Prominent educational organizations do not act urgently to respond to virtual schools. For instance, teacher training programs tend not to teach pre-service teachers strategies for virtual school instruction.[18] Despite calls for a shift in the teacher training paradigm, higher education leaders have not included virtual school teacher training in their programming.[19] The resistance of teacher training programs to incorporate online teaching practices or place pre-service teachers in virtual classrooms suggests a lack of urgency and a sense that virtual schools are not creating the disruptive environment that business and tech-minded individuals had expected. Despite the increase in enrollment observed during the pandemic the overwhelming majority of students are poised to learn in brick-and-mortar schools.

It is undeniable that technology offers benefits in appropriate contexts. Virtual schools can serve as an education option when appropriate. However, the virtual school sector is characterized by "technology solutionism,"[20] an over-reliance on technology to solve complex problems, creating opportunities for unethical actors to thrive. The unethical actors take advantage of policy loopholes and sell virtual schools as the solution to various educational challenges they are not equipped to address. Rather than becoming a disruptive innovation and promoting any sort of positive disruption, virtual schools have enabled unethical actors to exploit and harm the public education system.

Section III of this report underscores the accountability challenges related to unethical actors and reveals that lawmakers nationwide have struggled to implement safeguards on virtual schools. The lack of accountability occurs even though taxpayers subsidize the development of nonprofit and for-profit virtual schools. Legislative activity continues to stall, despite the enrollment growth and increased number of virtual schools. The enacted laws are not informed by empirical research, and, in many cases, lawmakers enact policies that oppose the recommendations presented in this and previous reports.

Reality: Virtual schools have not transformed student learning or acted as a beneficial disruptive innovation. In many cases, they have harmed the public education system.

Virtual schools are not a disruptive innovation because less than 1.5% of all students enroll in them, and students leave virtual schools at an alarming rate. Virtual schools negatively affect students who move and the brick-and-mortar schools they leave. Free-market designs have caused high student turnover in virtual charter schools because they are premised on constant enrollment churn as a mechanism to improve quality through competition.[21] A way to improve this reality is for school districts to intentionally design online programs and coach students into choosing virtual schools only when the model is suitable for their unique needs. Current practices often prioritize technology solutionism and focus solely on the capabilities of the technology, whereas best practices suggest that school leaders should prioritize aligning technology with instructional goals for a unique population of online students.[22] A way to improve this reality is to engage in more policy planning and intentionality in contrast to the current trend of unregulated market and technology solutionism.

Claim: Competition from virtual schools will efficiently improve traditional school districts organized mainly around brick-and-mortar schools.

Proponents of expanding virtual schools argue that virtual schools induce competition in education, leading to improvements across various school types.[23] This argument emerges from the market-based educational reform movement, which assumes that choice creates a "rising tide that lifts all boats."[24] Market reformers argue that choice options, such as virtual schools, compel other schools to act in ways that efficiently lead to improvement and innovation.

There is a significant body of research on the impact of competition on school improvement but less on the competitive effects of virtual schools. The overarching literature on competitive effects indicates that innovation and efficiency are not automatic outcomes of competitive environments. Some studies show limited competitive effects in specific choice-based models and with certain aspects of the educational process, but these findings are inconsistent.[25] Organizations often adopt similar practices rather than innovating, a phenomenon known as *isomorphism*.[26]

The literature on the competitive effects of virtual schools is less developed, but existing

studies should provide skepticism. On a superficial level, virtual schools prompt competition due to a gradual enrollment increase in virtual schools, which the pandemic exacerbated.[27] The question is if these enrollment increases result in innovation and efficiency across the system. The few existing studies that focus on virtual charter schools show that competition related to virtual schools has done more harm than good.[28] Studies have analyzed the competitive effects of these schools in Pennsylvania. They show that virtual charter schools reduce school district budgets,[29] harm rural schools because of rural districts' incapacity to absorb student losses,[30] modestly affect online learning adoption but also follow patterns of isomorphism,[31] and are not cost-efficient.[32] As Section I of this report shows, the virtual charter sector is dominated by large chains, where dozens of schools use the same curriculum products and instructional methods. This finding suggests that virtual schools are not sites of innovation and experimentation but monolithic monopolies.

The enrollment expansion of virtual charter schools may have accelerated school districts' creating or adopting their own virtual schools. However, a reasonable counterargument from the virtual school competitive effects literature is that school districts would have adopted online learning regardless of competition because districts respond to other forms of pressure such as state agency guidance and mandates.[33] Recently, the pandemic, rather than competition, was the primary driving force behind the increase in virtual school enrollment. Either way, maintaining a competitive environment is not cost-effective, particularly in rural areas, as funding multiple programs is more costly and less efficient than funding one. Section III of this report further explains virtual school cost inefficiencies.

Despite these inefficiencies, lawmakers have struggled to enact laws establishing appropriate funding formulas that reflect the actual cost of operating virtual schools. While virtual schools may cost less, virtual school funding policies across states have inflated costs. As Section III reports, some virtual charter schools have accumulated fund balances in the tens of millions of dollars. Lawmakers have also struggled to implement reforms to regulate enrollment trends driven by the free-market models that govern virtual schools, as their attempts to enforce boundary restrictions have found limited success. Some states have even relaxed restrictions, making virtual school enrollment more permissive.

Reality: Competition has negatively impacted traditional school districts organized mainly around brick-and-mortar schools, and competitive environments have been inefficient.

The current model of virtual schooling destabilizes brick-and-mortar schools through the loss of economies of scale and interruptions for students entering and leaving virtual schools. While some families may have positive experiences with virtual schools, their experiences come at the cost of negative impacts on the education system, and most students choose to remain in brick-and-mortar schools. The free-market enrollment model has led to inefficiencies because a robust market with fully funded alternatives is more expensive, due to the need to fund multiple competing programs. The current funding policies inflate the budgets of virtual schools and allow for misconduct. While virtual schools gained popularity because of the school choice movement, including the rise of virtual charter schools, traditional school districts have created virtual schools and often use the same software and

content as virtual charter schools.[34] A way to improve this reality is to prompt less chaotic enrollment patterns and determine the actual costs of running virtual schools.[35] Effective enrollment policies disincentivize abuse, and costing-out audits provide information on the actual costs of programs.

Claim: Virtual schools advance parental choice to provide better schooling options for families.

Virtual school advocates argue that virtual schools play a crucial role in school choice. In *Liberating Learning: Technology, Politics, and the Future of American Education*, Moe and Chubb highlight virtual charter schools as a prime example of the potential benefits of school choice. They argue that virtual charter schools embody the fundamental principles of the choice movement.[36]

Research on the school choice process has focused on understanding how parents navigate their available options and what motivates their decisions, which helps assess the effects of school choice policies.[37] Researchers have categorized parents' choice decisions into pull and push factors.[38] The pull factors that draw parents to virtual schools include the opportunity for individualized or flexible learning, the ability for parents to have more direct control over their children's education, and the ability to instill their personal values or religious beliefs.[39] Push factors that drive parents away from brick-and-mortar schools include bullying and health concerns. These factors are more common among children with disabilities.[40]

Families place varying emphases on push and pull factors, with differences based on demographics and past educational experiences.[41] Current research has built on past work showing that when virtual charters first emerged, the novelty of online schooling attracted families who were desperate to try anything other than the brick-and-mortar options that were not working for them.[42]

Choice patterns in virtual schools also relate to the demographic composition of students. An analysis of virtual charter schools on a national level show that they enroll lower percentages of economically disadvantaged students and higher percentages of White students compared to the overall student population in the state where they are located.[43] Section I of this report indicates a recent shift in these trends. Virtual schools are diversifying like other schools in the United States. As Figure 3 in Section I shows, the racial composition of virtual schools mirrors the national average for White students; however, virtual schools now have a higher concentration of Black and multi-race students than the national average. Hispanic and Asian students remain underrepresented in virtual schools.

Enrollment demographic findings vary by state, suggesting there is not a consistent population of students who enroll in virtual schools, particularly the virtual charter schools for which there have been better data to track. Much of the research on specific enrollment patterns is from the author's work on virtual charter schools in Pennsylvania. Mann and Baker found that demographic patterns in enrollment changed as the initial excitement surrounding virtual schooling subsided. As information about the low quality of virtual charter schools became widely known, virtual schools enrolled fewer students from financially ad-

vantaged traditional brick-and-mortar school districts.[44] Mann and colleagues show that an individual rural student is more likely than an urban student to enroll in a virtual charter school, although there are fewer rural than urban students overall.[45] Mann and Kotok examined student moves within the virtual charter school marketplace, showing that those selecting among virtual charter schools were likelier to choose lower-performing virtual schools, and choices exacerbated inequality.[46]

Overall, it is difficult to argue that, academically, virtual schools provide better academic options for families. While having more choices promotes the goal of expanding educational choice, studies show that choice does not always result in significant academic gains for students.[47] Table 6 of Section I of the report adds to the abovementioned research on performance and shows that 57.4% of virtual schools received an unacceptable rating in their most recent state performance rating. Table 7 in Section I shows virtual school graduation rates are 61.9%, compared to the national average of 86.5%. These findings are consistent with previous NEPC reports on virtual schools dating back to 2012.

Reality: While choice has expanded, the options available are not necessarily better.

Free-market assumptions and the allure of technology have led to thinking that virtual schools will be of high quality or at least will innovate until they get to that point. Virtual schools have existed for 30 years and repeatedly deliver poor educational outcomes and low graduation rates. A way to improve this reality is to hold virtual schools accountable for their dismal outcomes and graduation rates. The free market has proven not to hold itself accountable, and technology is not always a solution to providing high-quality education. Appropriate policies force virtual schools to find the appropriate uses for their programs or face the consequences if they do not.

Claim: Virtual schools provide personalized and flexible learning.

Advocates and providers of virtual schools argue that one benefit they offer is the ability to provide students with personalized and flexible learning experiences.[48] Personalized means students can choose what they are interested in or need to learn, and teachers can assist them in achieving these goals. Flexible means students can complete content at their own pace or at a time of their choosing. The challenge stemming from the research is that it has been difficult for researchers to understand virtual schools' curricula and instructional practices. One of the most informative studies on the subject is the 2015 Mathematica Policy Research report, which provides insight into the practices of virtual charter schools. The report stated that most of the time students spend in these schools is "individualized, student-driven independent study."[49]

Another challenge with personalization and flexibility is that these aims are often in opposition. Personalized learning environments rely on self-regulated learning and require structures that provide immediate data and feedback, student voice, and multiple forms of support.[50] These features of personalized learning environments do not align with flexibil-

ity, as they are resource-intensive and require direct, often immediate, teacher feedback. Another approach to providing personalization is through differentiated instruction that caters to the specific needs of students from diverse backgrounds. Online teachers report that they differentiate instruction for their students, but their strategies do not align with practices that positively impact student achievement, as online teachers tend to focus on a flawed notion of "learning styles" rather than on differentiation decisions based on student achievement data.[51]

Online schools typically rely on standardized materials and expect students to learn independently or with the support of their parents. As Curtis and Werth explain, a key element to student success in virtual schools is "Students must be self-motivated, engaged and participating, and accountable for their own learning. Parents should be available to monitor, mentor, and motivate students."[52] Virtual schools offer standardization rather than personalization, so they are more flexible than brick-and-mortar schools regarding pace and place. However, virtual schools offer a personalized and flexible pace within a standardized curriculum rather than genuine personalized learning. The standardization and rigidity of material are due to the adoption of free-market strategies in their enrollment models, prioritizing reaching many students over personalization. True personalization includes interactive and engaging experiences, often at the cost of flexibility. Virtual schools' only personalized feature is the speed at which a student moves through content.

Reality: Virtual schools provide flexibility but not personalization.

Flexibility depends on a predetermined curriculum that students can access as they see fit. Personalization, on the other hand, depends on a teacher to understand the needs of each student and design instruction and curriculum accordingly. Free-market pressures force virtual schools to remain flexible but not personalized, because a standardized, one-size-fits-all model of delivering content and curricula is more efficient than designing unique and individualized learning experiences. Assumptions about technology suggest that online learning can deliver personalized learning, but this is not the reality of what occurs in most virtual schools. A way to improve this reality is to ensure that students who require flexibility receive it and that students who require personalization receive it. This strategy requires virtual schools to determine case-by-case the needs of students and design programs that align with their needs.

Claim: Virtual schools provide high-quality instructional support with extended teacher interaction.

Virtual schools use language on their websites that suggests their teachers "interact and actively engage students."[53] Research shows that quality online programs develop interactive and engaging experiences among teachers and students. [54] Despite the importance of interaction in online education, a standard model in virtual schools is to limit teacher interaction and instead rely on "learning coaches" to supplement the learning experience.[55] A learning coach is a parent or caregiver who provides support and assistance to the student in areas where the teacher cannot fully engage or provide support due to the nature of the

online setting. Teachers have observed the parent's role in virtual schooling and report that parents indeed play an active role in scheduling educational activities, fostering relationship building, motivating student learning and engagement, and sometimes acting as the primary instructor.[56] Virtual schools broaden the role of parents in the educational process in a more active and influential role akin to homeschooling.[57] The advantage of this quasi-homeschooling model is that it allows for flexibility in terms of time and location for students to learn. This flexibility makes arranging real-time interactions with teachers and peers challenging.

Bradley-Dorsey and colleagues explain the tension between flexibility, interaction, and teacher quality by showing that interactions between students and teachers in virtual schools have been positively associated with various academic outcomes. Virtual schools prioritize flexibility, which limits opportunities for these interactions to occur.[58] The authors wrestled with this tension, saying, "Student-student and teacher-student interaction matter in both in-person and virtual schools. With that said, many virtual schools design their courses not to maximize student and teacher-student interaction, but to maximize flexibility for students to complete work anytime/anywhere."[59]

Section I of the report shows that virtual schools have significantly higher student-to-teacher ratios than brick-and-mortar schools. These ratios promote a reliance on supplementary instruction from parents and caregivers. If a parent cannot provide support, students may receive less instructional support than in a brick-and-mortar setting. The quasi-homeschooling model allows virtual schools to have higher teacher-student ratios, which would need to be reevaluated if a model with more teacher interaction were implemented.[60]

An additional challenge for virtual school teachers is that they are not trained to teach in online environments and do not need to meet specific virtual school licensing requirements akin to what is seen in brick-and-mortar schools.[61] Managing the unique aspects of online teaching requires specialized training and support.[62] Teacher preparation programs typically are designed for face-to-face instruction and do not include virtual school teacher training. Most teachers receive their training after they start teaching in virtual schools.[63]

Reality: Virtual teachers are undertrained and too overloaded to provide high-quality instruction.

Free-market pressures seek to minimize costs and load as many students as possible into classrooms, and the allure of technology prompts assumptions that online programming makes this arrangement manageable. Teachers in online schools have an excessive number of students and are unprepared.[64] Virtual schools rely on families to perform unpaid work to account for bloated student-teacher ratios. This model disadvantages families without resources and suggests that virtual schools can only cater to two-parent families with single incomes or more flexible work schedules. It is a modern version of homeschooling but with the added element of using public school funding to support it.[65] A way to improve this reality is to train virtual school teachers before they enter their roles, verify that they are highly qualified, and support virtual school teachers by reducing the number of students they are required to teach. Training, verifying, and supporting virtual school teachers is a

multipronged strategy that involves stakeholders from across the government and higher education.

Claim: Virtual schools save students at risk of dropping out of school or with substantial social issues that negatively affect their education.

Virtual schools could serve as a last-chance option for students who have had negative experiences in prior academic settings.[66] These students include those who may be at risk of dropping out or have experienced bullying or other negative experiences in brick-and-mortar school settings. The rationale behind the last-chance claim is that brick-and-mortar education settings have not been successful for these students, and alternative settings may provide a better fit to complete their studies.

The research about online learning and its effectiveness with at-risk students initially focused on credit recovery models. Most brick-and-mortar schools and districts supplement their programs with online credit recovery programs. As early as 2009, 88% of school districts offered online credit recovery programs.[67] For at-risk students to be successful in these programs, as is the case in brick-and-mortar schools, it is essential for them to feel a sense of care. Establishing caring relationships in online programs, particularly asynchronous ones, is challenging.[68]

As research on virtual schools has progressed, it has become clear that the findings from online credit recovery programs are relevant to virtual schools. The advantages of online learning can be drawbacks for at-risk students. The flexibility and self-paced structure of online programs can be beneficial for students with chaotic home lives but can hinder students with poor self-regulation skills.[69] For example, in one statewide virtual school, students with at-risk characteristics performed poorly in the virtual school setting compared to their peers.[70]

Research indicates that virtual schools are more likely to serve White and academically advantaged students than disadvantaged students.[71] Section I explains that the racial and ethnic demographic trends in virtual schools seem to be evolving, but Figure 4 in Section I shows virtual schools still only served 25.6% of students eligible for free and reduced-price lunch (FRL) in 2021-22, compared to the national average of 60.2% FRL students. Demographics alone do not determine if students are at risk, but they are helpful indicators. If virtual schools effectively served at-risk students, one would expect the demographic composition of these schools to reflect different patterns. These demographic patterns add concern because virtual schools' academic indicators and graduation rates are still dismal, despite their enrolling more students from advantaged backgrounds.

Reality: Virtual schools are often not appropriate for at-risk students.

Virtual schools have dismal academic quality records. Section I highlights virtual schools' persistent academic difficulties, adding to concerns found in other research studies. These struggles are compounded for at-risk students. Virtual schools remain a last resort for at-risk students who have struggled in other settings. A way to improve this reality is providing

students who are struggling in the brick-and-mortar classroom setting with more in-person support rather than moving them to a virtual school. While there may be circumstances such as work or family obligations that make virtual schooling the only option, it is crucial to develop more effective interventions in these cases.

Claim: Virtual schools provide educational access to students with special needs and allow for continued schooling in emergency health situations.

Virtual school providers argue that, at the very least, they can offer adequate special education services to students, while some imply they may even be able to provide superior services.[72] Scholars concur that when used appropriately, virtual learning has the potential to provide powerful opportunities for students with special needs. There is an established body of research on best practices for teaching special education in a virtual setting in an inclusive manner, including guidance from teachers with experience working with students in these settings.[73] Virtual schools have not been consistently implementing these best practices. Evidence from one state suggests that virtual charter schools enroll lower numbers of students with disabilities, particularly of those with more severe needs, and that they are not designed to serve students with autism or traumatic injuries.[74] As virtual schools emerged and developed, there has been a lack of clear guidance and oversight for students with Individualized Education Programs (IEPs), resulting in inadequate support for students with special needs.[75]

Virtual schools can offer some students a safer space than previous settings but fall short of providing adequate special education support. Evidence from one statewide virtual school suggests that special education students have lower academic achievement than students without special needs.[76] Beck and colleagues explain that despite concerns about academic quality, families with special needs students leave brick-and-mortar educational environments due to a lack of support for their child or instances of bullying; they show these families report elevated satisfaction levels with their new settings.[77] Ortiz and colleagues explain that parents appreciate a welcoming atmosphere and supportive staff in virtual schools; however, these schools often provide limited special education services, and many parents struggle with the new responsibility of serving as a learning coach.[78] Virtual schools can benefit students with special healthcare needs who have no other options, as they can accommodate needs that brick-and-mortar schools may not be able to. However, this group of students makes up an exceedingly small percentage of those enrolled in virtual schools.[79]=

Other challenges facing special education in virtual schools include difficulties adhering to the provisions outlined in a student's IEP and meeting the requirements of the Individuals with Disabilities Education Act (IDEA).[80] Lawmakers have struggled with addressing these challenges because they often focus on funding concerns and apply policies related to all charter schools rather than providing specific guidance and regulations for virtual schools and students with special needs.[81] A recent special education U.S. Supreme Court case has altered standards, leading virtual special education researchers and educators to call for more significant support for their students, as further compliance concerns are expected based on the new interpretation of the law.[82]

Reality: Virtual schools can serve as an emergency educational option, but they struggle to adhere to mandates of the Individuals with Disabilities Education Act (IDEA).

IDEA mandates that students with special needs receive a free and appropriate education in the least restrictive environment. Many special needs students are not encountering virtual school environments that suit their needs. Virtual schools struggle with meeting the goals of IEPs. A way to improve this reality is for virtual schools to offer programs that specifically meet student IEP requirements. If a virtual school is not an appropriate placement for a student with special needs, then students should move to other settings. Brick-and-mortar schools in traditional school districts are subject to regular monitoring and review of their compliance with special education standards, and legal action often occurs in cases of non-compliance. Virtual schools should face the same scrutiny.

Claim: Virtual schools expand access to educational materials.

The digital divide, which refers to the disparities in access and use of information and communication technologies (ICT), is a widely discussed issue in the technology industry. The Organization for Economic Cooperation and Development (OECD) describes it as "the gap between individuals, households, businesses, and geographic areas at different socioeconomic levels with regard both to their opportunities to access ICT and to their use of the internet."[83] The digital divide is pertinent to virtual schools because they could enhance access through the internet, which hypothetically enables anyone with an internet connection to access content and advanced courses.[84]

There are concerns that virtual schools fail to mitigate the digital divide due to disparities in proficiency and technology usage.[85] Access is known as the first level of the digital divide, but the two other levels to the digital divide, proficiency and usage, suggest that even if individuals have equal access to technological infrastructure there may still be divides. Section I demonstrates the multiple ways in which virtual schools produce worse student outcomes than brick-and-mortar schools. These adverse outcomes suggest a proficiency divide in mastering educational materials. Access to materials alone is insufficient if students cannot comprehend the material.

It is also unclear whether the materials provided by virtual schools are even adequate. Research on this topic is ongoing, and further studies are necessary to understand the nature of the materials offered by virtual schools. In one example, McBean and Feinberg criticized the history curriculum offered by a large virtual school in Georgia, arguing that it fails to represent marginalized perspectives and voices.[86] Virtual schools frequently make sample lessons and materials available on their websites that appear to comply with the state standards of the virtual school's location; however, there has been no comprehensive examination of these materials. Scholars have begun to address this gap by developing frameworks for evaluating the quality of online curricula that teachers and school administrators can use.[87] Given the inadequate learning outcomes and ambiguous nature of the materials, insufficient evidence supports the assertion that virtual schools improve access to educational materials.

Reality: Access becomes irrelevant if students cannot learn and understand the material.

The widespread availability of virtual schools superficially suggests that they provide access to educational content unavailable without them. For example, rural students without AP teachers can access AP content through a virtual school. The reality is less optimistic. Access to material is irrelevant if students cannot learn it. Students require the skills, dispositions, and environments that allow them to benefit from expanded material. A way to improve this reality is to ensure students have actual access by teaching them to use online materials. While it is essential to support infrastructure such as broadband, educational access is more than just infrastructure. Students will only have genuine access if they understand how to use the technology.

Conclusion and Recommendations

Virtual schools have existed for more than 30 years, but they have not lived up to the claims made about them. The COVID-19 pandemic has brought virtual schooling to the attention of many families. Even lawmakers who align with the political ideology that previously advocated for expanding virtual schools now advocate for in-person learning.[88]

Virtual schools are not fulfilling their promises due to virtual school policy models that incentivize adverse outcomes. These models emerged because those who designed them relied on two flawed assumptions. The first is that unregulated free markets can effectively address educational challenges. The second is that technology seamlessly replicates brick-and-mortar schools' teaching and learning practices. The reliance on these assumptions allows unethical actors to promote technology solutionism and sell virtual schools when they are inappropriate.[89]

Free-market enrollment models also undermine appropriate school funding plans. Virtual school funding rewards enrollment increases instead of properly assigning students. When funding is solely based on enrollment numbers and expansion, schools enroll students who are not a good fit for their programs, and schools prioritize reducing costs over quality. Additionally, education is not just about transmitting a set of standards to students. Learning is closely tied to place, and the physical environment of schooling plays a critical role in shaping the experiences of children.[90]

Of course, not all forms of choice are detrimental. Families have a unique understanding of their children's needs and play a vital role in their education. Similarly, technology is not inherently harmful. When used appropriately, online learning offers powerful experiences to supplement face-to-face settings. Technology, computers, and online learning are tools to be used judiciously and appropriately. Virtual schools, this review suggests, are most beneficial when deployed as tools with specific purposes rather than as organizations that prioritize enrollment expansion in a taxpayer-subsidized, free-market system. The way to achieve better uses of virtual schools is to rely on experts to design inclusive and universally beneficial systems.

Policymakers can take specific actions to ensure that virtual schools contribute positively to the education landscape in the United States:

To support students and families, it is recommended that state policymakers:

- Establish a virtual school student intake screening and encourage parents to reconsider enrollment if a virtual school is not a good fit for their students.
- Fund one-on-one counseling for at-risk students and require the counselor to recommend to the family if virtual schools are inappropriate for the at-risk student.
- Require Individualized Education Plans for all students in virtual schools, akin to what special education students receive. The plans should indicate if students need standardized or personalized programs and then deliver content according to these plans.
- Notify parents and encourage them to withdraw their students from virtual schools if the student is failing to obtain mastery.

To manage virtual school enrollment and performance, it is recommended that state policymakers:

- Require virtual schools to train all incoming students on using their software and programs through in-person training sessions.
- Set maximum teacher-to-pupil ratios for virtual schools that align with statewide averages.
- Require virtual schools to state publicly if their programs are standardized or personalized.
- Require virtual schools to align curricula with state standards and use student mastery as a performance indicator.
- Require virtual school graduation rates to align with statewide averages. If the virtual school fails to meet these benchmarks, assign it probationary status after a year and close after five years of probationary status.
- Require virtual schools to maintain a within-school-year student mobility threshold equal to the mobility rate of brick-and-mortar schools.

To improve system-level capacity and accountability, it is recommended that state policymakers:

- Audit and monitor special education Individualized Education Plans in virtual schools.
- Enact yearly enrollment growth caps for virtual schools.
- Require virtual school field experiences for teacher licensure.
- Fund professional organizations and schools of education to develop teacher training programs for virtual schools and tie these programs to teacher licensure.
- Establish virtual school-specific licensure requirements derived from recognized standards for quality online teaching such as the National Standards for Quality Online

Learning.

- Conduct yearly costing-out studies and set statewide virtual school tuition rates in alignment with the actual costs of operating virtual schools.
- Create programs in state education departments that oversee virtual school operations, allowing for implementation and oversight of the preceding recommendations.

Notes and References Section II

1 McElrath, K. (2020, August). *Nearly 93% of households with school-age children report some form of distance learning during COVID-19*. Washington, DC: United States Census Bureau. Retrieved August 24, 2022, from https://www.census.gov/library/stories/2020/08/schooling-during-the-covid-19- pandemic.html

2 Watson, J., Pape, L., Murin, A., Gemin, B., & Vashaw, L. (2014). *Keeping pace with K–12 digital learning: An annual review of policy and practice (11th ed.)* (p. 26). Durango, CO: Evergreen Education Group. Retrieved November 11, 2022, from https://files.eric.ed.gov/fulltext/ED558147.pdf

3 National Center for Education Statistics (NCES). (2022, October). *Scores decline in NAEP reading at Grades 4 and 8 compared to 2019*. Washington, DC: GPO. Retrieved November 1, 2022, from https://www.nationsreportcard.gov/highlights/reading/2022/

National Center for Education Statistics (NCES). (2022, October). *Largest score declines in NAEP mathematics at Grades 4 and 8 since initial assessments in 1990*. Washington, DC: GPO. Retrieved November 1, 2022, from https://www.nationsreportcard.gov/highlights/mathematics/2022/

4 Huck, C. & Zhang, J. (2021). Effects of the COVID-19 pandemic on K–12 education: A systematic literature review. *Educational Research and Development Journal, 24*(1), 53–84. Retrieved August 24, 2022, from https://files.eric.ed.gov/fulltext/EJ1308731.pdf

5 Gross, B. (2021, September). *Surging enrollment in virtual schools during the pandemic spurs new questions for policymakers*. Bothell, WA: Center on Reinventing Public Education (CRPE). Retrieved August 24, 2022, from https://crpe.org/surging-enrollment-in-virtual-schools-during-the-pandemic-spurs-new-questions-for-policymakers/

Diliberti, M.K. & Schwartz, H. (2021). *The rise of virtual schools: Selected findings from the third American school district panel survey*. Santa Monica, CA: RAND Corporation. Retrieved March 11, 2023, from https://www.rand.org/pubs/research_reports/RRA956-5.html

6 Virtual charter schools are a common type of virtual schools that emerged from charter school policy and operate outside of the traditional brick-and-mortar public school system. Many virtual schools run out of school districts and some out of private schools. This review considers all types of virtual schools where appropriate.

7 The term “disruptive innovation” and related terms linked to the word “disrupt” are commonly deployed in the business and technology fields with an assumption that disruptive practices are inherently positive and worth pursuing. The goal of these fields is to seek disruption, particularly in education because the business and technology-minded individuals using the term tend to claim the status quo of public education is broken. While this section of the report attempts to denote positive and negative connotations of disruption and use this term in framing why virtual schools have run amiss, it is important to note that the assumption of disruption being inherently positive is highly problematic. Of course, sometimes disruptions to the status quo produce benefits to society, but other times disruptions corrupt or destroy practices in ways that harm the public good. While this report does not venture into the realm of delineating the connotation of the word “disruption” and uses the term in as value-neutral manner as possible, it is recommended others tread carefully when deploying the word disruption in conversations about education reform.

8 Christensen, C.M., Horn, M.B., & Johnson, C.W. (2011). *Disrupting class: How disruptive innovation will change the way the world learns*. New York, NY: McGraw-Hill.

Moe, T.M. & Chubb, J.E. (2009). *Liberating learning: Technology, politics, and the future of American education*. San Francisco, CA: John Wiley and Sons, Inc.

9 Moe, T.M. & Chubb, J.E. (2009). *Liberating learning: Technology, politics, and the future of American education* (p. 12). San Francisco, CA: John Wiley and Sons, Inc.

10 The NEPC Virtual School reports, like this one, have consistently shown negative results on a yearly basis. Other prominent studies of full-time virtual schools (mainly regarding the virtual charter school type) are:

Cordes, S. (2023). Cyber versus brick and mortar: Achievement, attainment, and postsecondary outcomes in Pennsylvania charter high schools. *Education Finance and Policy*. Advance online publication. Retrieved February 10, 2023, from https://doi.org/10.1162/edfp_a_00399

Fitzpatrick, B.R., Berends, M., Ferrare, J.J., & Waddington, R.J. (2020). Virtual illusion: Comparing student achievement and teacher and classroom characteristics in online and brick-and-mortar charter schools. *Educational Researcher, 49*(3), 161–175. Retrieved August 25, 2022, from https://journals.sagepub.com/doi/full/10.3102/0013189X20909814

Ahn, J., & McEachin, A. (2017). Student enrollment patterns and achievement in Ohio's online charter schools. *Educational Researcher, 46*(1), 44–57. Retrieved August 25, 2022, from https://journals.sagepub.com/doi/full/10.3102/0013189X17692999

Woodworth, J.L., Raymond, M.E., Chirbas, K., Gonzalez, M., Negassi, Y., Snow, W., & Van Donge, C. (2015). *Online charter school study*. Stanford, CA: Center for Research on Educational Outcomes. Retrieved August 25, 2022, from https://charterschoolcenter.ed.gov/sites/default/files/files/field_publication_attachment/Online%20Charter%20Study%20Final.pdf

Bueno, C. (2020, July). *Bricks and mortar vs. computers and modems: The impacts of enrollment in K–12 virtual schools*. Rochester, NY: Social Science Research Network. Retrieved August 25, 2022, from http://dx.doi.org/10.2139/ssrn.3642969

11 Wang, Y. & Decker, J.R. (2014, November). Can virtual schools thrive in the real world? *TechTrends, 58*(6), 57–62. Retrieved August 25, 2022, from https://eric.ed.gov/?id=EJ1042917

12 Lueken, M., Ritter, G., & Beck, D. (2015). Value-added in a virtual learning environment: An evaluation of a virtual charter school. *Journal of Online Learning Research, 1*(3), 305–335. Retrieved August 26, 2022, from https://files.eric.ed.gov/fulltext/EJ1148609.pdf

13 Hamlin, D., Adigun, O., & Adams, C. (2023). Do virtual schools deliver in rural areas? A longitudinal analysis of academic outcomes. *Computers & Education, 199*(July), 305–335. Retrieved April 22, 2023, from https://doi.org/10.1016/j.compedu.2023.104789

14 Watson, J., Pape, L., Murin, A., Gemin, B., & Vashaw, L. (2014). *Keeping pace with K–12 digital learning: An annual review of policy and practice (11th ed.)* (p. 26). Durango, CO: Evergreen Education Group. Retrieved November 11, 2022, from https://files.eric.ed.gov/fulltext/ED558147.pdf

15 Mann, B. (2017). *Navigating the web of choice: School district enrollments and responses to cyber charter schools* (p. 3) [Doctoral dissertation, Pennsylvania State University]. ProQuest Dissertations and Theses Global.

16 Rouhanifard, P. & Doron, S. (2022, April). Time for a new normal. *Education Next, 22*(3). Retrieved January 6, 2023, from https://www.educationnext.org/time-for-a-new-normal-forum-covid-19-precautions-in-schools/

17 Reich, J. (2020). *Failure to disrupt: Why technology alone can't transform education*. Cambridge, MA: Harvard University Press.

18 Archambault, L. & Larson, J. (2015). Pioneering the digital age of instruction: Learning from and about K–12 online teachers. *Journal of Online Learning Research, 1*(1), 49–83. Retrieved August 25, 2022, from https://files.eric.ed.gov/fulltext/EJ1148866.pdf

19 Herold, B. (2021, May 18). Remote learning is changing schools. Teacher-preparation programs have to adjust. *Education Week*. Retrieved December 16, 2022, from https://www.edweek.org/teaching-learning/remote-learning-is-changing-schools-teacher-preparation-programs-have-to-adjust/2021/05

20 Teräs, M., Suoranta, J., Teräs, H., & Curcher, M. (2020). Post-COVID-19 education and education technology "solutionism": A seller's market. *Postdigital Science and Education, 2*(3), 863–878. Retrieved August 26, 2022, from https://link.springer.com/content/pdf/10.1007/s42438-020-00164-x.pdf

21 Van Vooren, S. (2017). *The K–12 online teaching dynamic: A study of educators at multiple cyber charter schools in Pennsylvania* (p. 46) [Doctoral dissertation, Drexel University]. ProQuest Dissertations and Theses Global.

22 Basham, J., Smith, S., Greer, D., & Marino, M. (2013). The scaled arrival of K–12 online education: Emerging realities and implications for the future of education. *Journal of Education, 193*(2), 51–60. Retrieved August 30, 2022, from https://doi.org/10.1177/002205741319300206

23 Moe, T.M., & Chubb, J.E. (2009). *Liberating learning: Technology, politics, and the future of American education* (p. 12). San Francisco, CA: John Wiley and Sons, Inc.

24 Hoxby, C.M. (2001). Rising tide: New evidence on competition and the public schools. *Education Next, 1*(4), 68–74. Retrieved June 18, 2019, from https://www.educationnext.org/rising-tide/

25 Sass, T., Zimmer, R., Gill, B., & Booker, K. (2016). Charter high school's effect on educational attainment and earnings. *Journal of Policy Analysis and Management, 35*(3), 683–706. Retrieved May 22, 2022, from https://onlinelibrary.wiley.com/doi/10.1002/pam.21913

Bifulco, R. & Ladd, H. (2006). The impacts of charter schools on student achievement: Evidence from North Carolina. *Education Finance and Policy, 1*(1), 50–90. Retrieved May 22, 2022, from https://doi.org/10.1162/edfp.2006.1.1.50

Bifulco, R., & Reback, R. (2013). Fiscal impacts of charter schools: Lessons from New York. *Education Finance and Policy, 9*(1), 86–107. Retrieved May 22, 2022, from https://doi.org/10.1162/EDFP_a_00121

Bettinger, E.P. (2005). The effect of charter schools on charter students and public schools. *Economics of Education Review, 24*(2), 133–147. Retrieved May 22, 2022, from https://doi.org/10.1016/j.econedurev.2004.04.009

Buddin, R. & Zimmer, R. (2009). Is charter school competition in California improving the performance of traditional public schools? *Public Administration Review, 69*(5), 831–845. Retrieved May 22, 2022, from https://www.jstor.org/stable/40468963

Arum, R. (1996). Do private schools force public schools to compete? *American Sociological Review, 61*(1), 29–46. Retrieved May 22, 2022, from https://doi.org/10.2307/2096405

26 Lubienski, C. (2003). Innovation in education markets: Theory and evidence on the impact of competition and choice in charter schools. *American Educational Research Journal, 40*(2), 395–443. Retrieved June 18, 2019, from https://doi.org/10.3102/00028312040002395

27 Dee, T.S. & Murphy, M. (2021). Patterns in the pandemic decline of public school enrollment. *Educational Researcher, 50*(8), 566–569. Retrieved June 2, 2022, from https://doi.org/10.3102/0013189x211034481

28 Waters, L.H., Barbour, M.K., & Menchaca, M.P. (2014). The nature of online charter schools: Evolution and emerging concerns. *Journal of Educational Technology & Society, 17*(4), 379–389. Retrieved June 7, 2022, from https://www.jstor.org/stable/jeductechsoci.17.4.379

29 Mann, B. & Baker, D.P. (2019). 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. Retrieved June 7, 2022, from https://doi.org/10.1086/701249

30 Mann, B., Frankenberg, E., Kotok, S., & Fuller, E. (2016). Choice, cyber charter schools, and the educational marketplace for rural school districts. *The Rural Educator, 37*(3), 17–29. Retrieved June 7, 2022, from https://files.eric.ed.gov/fulltext/EJ1225320.pdf

Mann, B., & Baker, D.P. (2019). 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. Retrieved June 7, 2022, from https://doi.org/10.1086/701249

31 Mann, B. (2020). Compete, conform, or both? School district responses to statewide cyber charter schools. *Journal of School Choice, 14*(1), 49–74. Retrieved June 7, 2022, from https://doi.org/10.1080/15582159.2019.1566996

32 Mann, B., & Bruno, P. (2022). The effects of charter school enrollment losses and tuition reimbursements on school districts: Lifting boats or sinking them? *Educational Policy, 36*(5), 1078–1107. Retrieved August 3, 2022, from https://doi.org/10.1177/0895904820951124

33 Mann, B. (2020). Compete, conform, or both? School district responses to statewide cyber charter schools. *Journal of School Choice, 14*(1), 49–74. Retrieved June 7, 2022, from https://doi.org/10.1080/15582159.2019.1566996

34 Mann, B. (2017). *Navigating the web of choice: School district enrollments and responses to cyber charter schools* (p. 81) [Doctoral dissertation, Pennsylvania State University]. ProQuest Dissertations and Theses Global.

35 Ahn, J. (2011). Policy, technology, and practice in cyber charter schools: Framing the issues. *Teachers College Record, 113*(1), 1–26. Retrieved June 7, 2022, from https://journals.sagepub.com/doi/pdf/10.1177/016146811111300103

Stedrak, L., Ortagus, J., & Wood, R. (2012). The funding of virtual schools in public elementary and secondary education. *Educational Considerations, 39*(2), 44–54. Retrieved June 7, 2022, from https://newprairiepress.org/edconsiderations/vol39/iss2/7/

Mann, B. & Baker, D.P. (2019). 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. Retrieved June 7, 2022, from https://doi.org/10.1086/701249

36 Moe, T.M. & Chubb, J.E. (2009). *Liberating learning: Technology, politics, and the future of American education* (p. 12). San Francisco, CA: John Wiley and Sons, Inc.

37 Lareau, A. & Goyette, K. (Eds.). (2014). *Choosing homes, choosing schools*. New York, NY: Russell Sage Foundation.

38 Altenhofen, S., Berends, M., & White, T.G. (2016). School choice decision making among suburban, high-income parents. *AERA Open, 2*(1), 1–14. Retrieved March 12, 2023, from https://doi.org/10.1177/2332858415624098

39 Chandler, J.A. (2015). A survey of the factors influencing parents in Michigan to select full-time cyber learning for their children in grades K–6 [Doctoral dissertation, Seton Hall University]. ProQuest Dissertations and Theses Global.

40 Beck, D., Tran, B., Maranto, R., & Clark, T. (2021). Why they come and go: Comparing special education and general education students in cyber schools. *Journal of Online Learning Research, 7*(3), 233–248. Retrieved June 7, 2022, from https://doi.org/10.1016/j.compedu.2014.03.011

Beck, D., Egalite, A., & Maranto, R. (2014). Why they choose and how it goes: Comparing special education and general education cyber student perceptions. *Computers and Education, 76*(July), 70–79. Retrieved June 7, 2022, from https://doi.org/10.1016/j.compedu.2014.03.011

41 Schultz, A. (2019). *Why parents of students with disabilities enrolled their child in an online charter school* [Doctoral Dissertation, California State Technical University, Pomona]. ProQuest Dissertations and Theses Global.

42 Marsh, R., Carr-Chellman, A., & Sockman, B. (2009). Selecting silicon: Why parents choose cybercharter schools. *TechTrends, 53*(4), 32–36. Retrieved January 3, 2019, from https://link.springer.com/article/10.1007/s11528-009-0303-9

43 Mann, B. (2019). Whiteness and economic advantage in digital schooling: Diversity patterns and equity considerations for K–12 online charter schools. *Education Policy Analysis Archives, 27*(105). Retrieved June 7, 2022, from https://doi.org/10.14507/epaa.27.4532

44 Mann, B. & Baker, D.P. (2019). 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. Retrieved June 7, 2022, from https://doi.org/10.1086/701249

45 Mann, B., Frankenberg, E., Kotok, S., & Fuller, E. (2016). Choice, cyber charter schools, and the educational marketplace for rural school districts. *The Rural Educator, 37*(3), 17–29. Retrieved June 7, 2022, from https://files.eric.ed.gov/fulltext/EJ1225320.pdf

46 Mann, B. & Kotok, S. (2019). Online stratification: How academic performance indicators relate to choices between cyber charter schools. *Teachers College Record, 121*(3), 1–24. Retrieved June 7, 2022, from https://doi.org/10.1177/016146811912100307

47 Berends, M. (2015). Sociology and school choice: What we know after two decades of charter schools. *Annual Review of Sociology, 41*, 159–180. Retrieved March 12, 2023, from https://doi.org/10.1146/annurev-soc-073014-112340

48 Compass Charter Schools. (2017, March). *5 benefits of online education for K–12 scholars*. Thousand Oaks, CA. Retrieved April 2, 2022, from https://www.compasscharters.org/5-benefits-of-online-education-for-k-12-scholars/

Achieve Virtual Academy. (n.d.). *Virtual learning: What is it?* Indianapolis, IN. Retrieved April 2, 2022, from https://achievevirtual.org/blog/student-resources/k-through-12-virtual-education-benefits/

Werrell, B. (2019, December). *The 5 main benefits of attending online school.* Baltimore, MD: Connections Academy by Pearson. Retrieved April 2, 2022, from https://www.connectionsacademy.com/support/resources/article/five-main-benefits-of-online-school/

49 Gill, B., Walsh, L., Smither Wulsin, C., Matulewicz, H., Severn, V., Grau, E., Lee, A., & Kerwin, T. (2015, October). *Inside online charter schools* (p. 10). Washington, DC: Mathematica Policy Research. Retrieved August 24, 2022, from https://files.eric.ed.gov/fulltext/ED560967.pdf

50 Basham, J., Hall, T., Carter Jr., R., & Stahl, W. (2016). An operationalized understanding of personalized learning. *Journal of Special Education Technology, 31*(3), 126–136. Retrieved August 30, 2022, from https://doi.org/10.1177/0162643416660835

51 Beasley, J. & Beck, D. (2017). Defining differentiation in cyber schools: What online teachers say. *TechTrends, 61*(6), 550–559. Retrieved April 7, 2022, from https://doi.org/10.1007/s11528-017-0189-x

52 Curtis, H. & Werth, L. (2015). Fostering student success and engagement in a K–12 online school. *Journal of Online Learning Research, 1*(2), 163–190. Retrieved April 7, 2022, from https://www.learntechlib.org/primary/d/150962

53 Butler, A. (2017, September). *What is it like teaching in a cyber school?* Exton, PA: Achievement House Cyber Charter School. Retrieved April 2, 2022, from https://achievementcharter.com/blog/what-is-it-like-teaching-in-a-cyber-school/

Connections Academy Kansas. (2022). *Learning without limits: Ignite your child's passions*. Newton, KS. Retrieved January 5, 2022, from https://www.compasscharters.org/5-benefits-of-online-education-for-k-12-scholars/

54 Martin, F. & Borup, J. (2022). Online learner engagement: Conceptual definitions, research themes, and supportive practices. *Educational Psychologist, 57*(3), 162–177. Retrieved January 7, 2022, from https://doi.org/10.1080/00461520.2022.2089147

Borup, J., Walters, S., & Call-Cummings, M. (2020). Student perceptions of their interactions with peers at a cyber charter high school. *Online Learning, 24*(2), 207–224. Retrieved April 7, 2022, from https://files.eric.ed.gov/fulltext/EJ1260358.pdf

Borup, J., Graham, C., & Drysdale, J. (2014). The nature of teacher engagement at an online high school. *British Journal of Educational Technology, 45*(5), 793–806. Retrieved April 7, 2022, from https://doi.org/10.1111/bjet.12089

55 Waters, L.H. & Leong, P. (2014). Who is teaching? New roles for teachers and parents in cyber charter schools. *Journal of Technology and Teacher Education, 22*(1), 33–56. Retrieved May 10, 2022, from https://www.learntechlib.org/primary/d/112373

56 Borup, J. (2016). Teacher perceptions of parental engagement at a cyber school. *Journal of Research on Technology in Education, 48*(2), 67–83. Retrieved June 11, 2022, from https://doi.org/10.1080/15391523.2016.1146560

57 Currie-Rubin, R. & Smith, S.J. (2014). Understanding the roles of families in virtual learning. *Teaching Exceptional Children, 46*(5), 117–126. Retrieved June 11, 2022, from https://doi.org/10.1177/0040059914530101

Mann, B. (2017). Homeschooling 2.0: An overview of online learning in K–12 education across the United States. In M. Gaither (Ed.), *The Wiley Handbook of Home Education* (pp. 246–267). Malden, MA: John Wiley & Sons, Inc.

58 Bradley-Dorsey, M., Beck, D., Maranto, R., Tran, B., Clark, T., & Liu, F. (2022). Is cyber like in-person? Relationships between student-student, student-teacher interaction and student achievement in cyber schools. *Computers and Education Open, 3*(December), 1–12. Retrieved January 8, 2023, from https://doi.org/10.1016/j.caeo.2022.100101

59 Bradley-Dorsey, M., Beck, D., Maranto, R., Tran, B., Clark, T., & Liu, F. (2022). Is cyber like in-person? Relationships between student-student, student-teacher interaction and student achievement in cyber schools. *Computers and Education Open, 3*(December), 11. Retrieved January 8, 2023, from https://doi.org/10.1016/j.caeo.2022.100101

60 Gill, B., Walsh, L., Smither Wulsin, C., Matulewicz, H., Severn, V., Grau, E., Lee, A., & Kerwin, T. (2015, October). *Inside online charter schools* (pp. 14–15). Washington, DC: Mathematica Policy Research. Retrieved August 24, 2022, from https://files.eric.ed.gov/fulltext/ED560967.pdf

61 Archambault, L., DeBruler, K., & Freidhoff, J. (2014). K–12 online and blended teacher licensure: Striking a balance between policy and preparedness. *Journal of Technology and Teacher Education*, *22*(1), 83–106. Retrieved March 13, 2023, from https://www.learntechlib.org/p/112361/

62 Pulham, E., & Graham, C. (2018). Comparing K–12 online and blended teaching competencies: A literature review. *Distance Education, 39*(3), 411–432. Retrieved August 25, 2022, from https://doi.org/10.1080/01587919.2018.1476840

63 Archambault, L. & Larson, J. (2015). Pioneering the digital age of instruction: Learning from and about K–12 online teachers. *Journal of Online Learning Research, 1*(1), 49–83. Retrieved August 25, 2022, from https://files.eric.ed.gov/fulltext/EJ1148866.pdf

64 Gill, B., Walsh, L., Smither Wulsin, C., Matulewicz, H., Severn, V., Grau, E., Lee, A., & Kerwin, T. (2015, October). *Inside online charter schools* (p. 10). Washington, DC: Mathematica Policy Research. Retrieved August 24, 2022, from https://files.eric.ed.gov/fulltext/ED560967.pdf

Kennedy, K., & Archambault, L. (2012). Offering preservice teachers field experiences in K–12 online learning: A national survey of teacher education programs. *Journal of Teacher Education, 63*(3), 185–200. Retrieved August 25, 2022, from https://doi.org/10.1177/0022487111433651

65 Mann, B. (2017). Homeschooling 2.0: An overview of online learning in K–12 education across the United States. In M. Gaither (Ed.), *The Wiley Handbook of Home Education* (246–267). Malden, MA: John Wiley & Sons, Inc.

66 Lewis, S., Whiteside, A., & Dikkers, A.G. (2014). Autonomy and responsibility: Online learning as a solution for at-risk high school students. *International Journal of E-Learning & Distance Education/Revue internationale du e-learning et la formation à distance, 29*(2). Retrieved August 30, 2022, from https://www.ijede.ca/index.php/jde/article/view/883/1543

67 Powell, A., Roberts, V., & Patrick, S. (2015). Using online learning for credit recovery: Getting back on track to graduation. Promising practices in blended and online learning series. *International Association for K–12 Online Learning*. As cited in Barnett, K. (2016). The at-risk student's journey with online course credit: Looking at perceptions of care. *Journal of Online Learning Research, 2*(4), 367–398. Retrieved August 25, 2022, from https://www.learntechlib.org/primary/d/172568

68 Barnett, K. (2016). The at-risk student's journey with online course credit: Looking at perceptions of care. *Journal of Online Learning Research, 2*(4), 367–398. Retrieved August 25, 2022, from https://files.eric.ed.gov/fulltext/EJ1148596.pdf

Oliver, K. & Kellogg, S. (2015). Credit recovery in a virtual school: Affordances of online learning for the at-risk student. *Journal of Online Learning Research, 1*(2), 191–218. Retrieved August 25, 2022, from https://files.eric.ed.gov/fulltext/EJ1148607.pdf

69 Lewis, S., Whiteside, A., & Dikkers, A.G. (2014). Autonomy and responsibility: Online learning as a solution for at-risk high school students. *International Journal of E-Learning & Distance Education/Revue internationale du e-learning et la formation à distance, 29*(2). Retrieved August 30, 2022, from https://www.ijede.ca/index.php/jde/article/view/883/1543

Barbour, M. & Siko, J. (2012). Virtual schooling through the eyes of an at-risk student: A case study. *European Journal of Open, Distance and E-Learning, 15*(1). Retrieved August 30, 2022, from http://www.eurodl.org/materials/contrib/2012/Barbour_Siko.pdf

70 Mann, B., Li, W., & Besnoy, K. (2021). Digital divides: K–12 student profiles and online learning. *Education Policy Analysis Archives, 29*(August–December). Retrieved June 7, 2022, from https://doi.org/10.14507/epaa.29.6351

71 Mann, B. (2019). Whiteness and economic advantage in digital schooling: Diversity patterns and equity considerations for K–12 online charter schools. *Education Policy Analysis Archives, 27*(105). Retrieved June 7, 2022, from https://doi.org/10.14507/epaa.27.4532

Wang, Y. & Decker, J.R. (2014). Examining digital inequities in Ohio's K–12 virtual schools: Implications for educational leaders and policymakers. *International Journal of Educational Reform, 23*(4), 294–314. Retrieved June 7, 2022, from https://scholarworks.gsu.edu/eps_facpub/19

72 Kirk, V. (2023, January). *How online school supports students with special needs.* Baltimore, MD: Connections Academy by Pearson. Retrieved January 8, 2022, from https://www.connectionsacademy.com/support/resources/article/accommodating-special-needs-with-online-education-technology/

Agora Cyber Charter. (2022). *Special education.* Prussia, PA. Retrieved January 5, 2022, from https://agora.

org/academics/special-education/

Achievement House Cyber Charter School. (2022). *Special Education*. Exton, PA. Retrieved January 5, 2022, from https://achievementcharter.com/special-education/

Stride K12. (2023). *Explore services for students with special needs at Stride K12-powered schools*. Herndon, VA. Retrieved January 5, 2022, from https://www.k12.com/online-public-schools/special-education.html

73 Rice, M. & Dunn, M. (2022). Inclusive online and distance education for learners with dis/abilities. *Distance Education, 43*(4), 483–488. Retrieved January 8, 2022, from https://doi.org/10.1080/01587919.2022.2145936

Crouse, T. & Rice, M. (2018). Learning to serve students with disabilities online: Teachers' perspectives. *Journal of Online Learning Research, 4*(2), 123–145. Retrieved August 30, 2022, from https://www.learntechlib.org/primary/d/182859

Greer, D., Rowland, A.L., & Smith, S.J. (2014). Critical considerations for teaching students with disabilities in online environments. *Teaching Exceptional Children, 46*(5), 79–91. Retrieved August 30, 2022, from https://doi.org/10.1177/0040059914528105

74 LeClair, A., Regullano, E.G., & Swinburn, A. (2019). *State of denial: California charter schools and special education students*. Los Angeles, CA: California Teachers Association and United Teachers Los Angeles. Retrieved April 22, 2023, from https://www.cta.org/wp-content/uploads/2020/03/State-of-Denial-Report.pdf

75 Basham, J., Carter Jr., R., Rice, M., & Ortiz, K. (2016). Emerging state policy in online special education. *Journal of Special Education Leadership, 29*(2), 70–78. Retrieved August 30, 2022, from http://files.eric.ed.gov/fulltext/EJ1118526.pdf

76 Mann, B., Li, W., & Besnoy, K. (2021). Digital divides: K–12 student profiles and online learning. *Education Policy Analysis Archives, 29*(August–December). Retrieved June 7, 2022, from https://doi.org/10.14507/epaa.29.6351

77 Beck, D., Egalite, A., & Maranto, R. (2014). Why they choose and how it goes: Comparing special education and general education cyber student perceptions. *Computers and Education, 76*(July), 70–79. Retrieved June 7, 2022, from https://doi.org/10.1016/j.compedu.2014.03.011

78 Ortiz, K., Rice, M., Curry, T., Mellard, D., & Kennedy, K. (2021). Parent perceptions of online school support for children with disabilities. *American Journal of Distance Education, 35*(4), 276–292. Retrieved August 30, 2022, from https://doi.org/10.1080/08923647.2021.1979343

79 Fernandez, H., Ferdig, R.E., Thompson, L.A., Schottke, K., & Black, E.W. (2016). Students with special health care needs in K–12 virtual schools. *Journal of Educational Technology & Society, 19*(1), 67–75. Retrieved August 30, 2022, from https://www.jstor.org/stable/jeductechsoci.19.1.67

Mann, B., Li, W., & Besnoy, K. (2021). Digital divides: K–12 student profiles and online learning. *Education Policy Analysis Archives, 29*(August–December). Retrieved June 7, 2022, from https://doi.org/10.14507/epaa.29.6351

80 Rice, M. & Carter Jr., R.A. (2015). When we talk about compliance, it's because we lived it: Online educators' roles in supporting students with disabilities. *Online Learning, 19*(5), 18–36. Retrieved August 30, 2022, from https://files.eric.ed.gov/fulltext/EJ1085761.pdf

Rice, M., Oritz, K., Curry, T., & Petropoulos, R. (2019). A case study of a foster parent working to support a child with multiple disabilities in a full-time virtual school. *Journal of Online Learning Research, 5*(2), 145–168. Retrieved August 30, 2022, from http://files.eric.ed.gov/fulltext/EJ1229408.pdf

81 Ortiz, K., Mellard, D., Deschaine, M., Rice, M., & Lancaster, S. (2020). Providing special education services in

fully online statewide virtual schools: A policy scan. *Journal of Special Education Leadership, 33*(1). Retrieved August 30, 2022, from https://eric.ed.gov/?id=EJ1274889

82 Ortiz, K., Rice, M., McKeown, T., & Tonks, D. (2020). Inclusion in online learning environments [Special Issue]. *Journal of Online Learning Research, 6*(3), 171–176. Retrieved August 30, 2022, from https://www.learntechlib.org/primary/p/218374/

83 OECD. (2001, January 1). Understanding the digital divide (p. 5). *OECD Digital Economy Papers,* 49. Paris, France. Retrieved June 7, 2022, from https://doi.org/10.1787/236405667766

84 Wang, Y. & Decker, J.R. (2014). Examining digital inequities in Ohio's K–12 virtual schools: Implications for educational leaders and policymakers. *International Journal of Educational Reform, 23*(4), 294–314. Retrieved June 7, 2022, from https://scholarworks.gsu.edu/eps_facpub/19

85 Mann, B., Li, W., & Besnoy, K. (2021). Digital divides: K–12 student profiles and online learning. *Education Policy Analysis Archives, 29*(August–December). Retrieved June 7, 2022, from https://doi.org/10.14507/epaa.29.6351

86 McBean, T.R. & Feinberg, J.R. (2020). Critically examining virtual history curriculum. *The Journal of Social Studies Research, 44*(1), 61–76. Retrieved January 7, 2022, from https://doi.org/10.1016/j.jssr.2019.08.002

87 Rice, M. & Ortiz, K. (2021). Evaluating digital instructional materials for K–12 online and blended learning. *TechTrends, 65*(6), 977–992. Retrieved August 30, 2022, from https://doi.org/10.1007/s11528-021-00671-z

Greer, D., Rice, M., & Deshler, D. (2014). Applying principles of text complexity to online learning environments. *Perspectives on Language and Literacy, 40*(1), 9–14. Retrieved August 30, 2022, from https://dyslexialibrary.org/wp-content/uploads/file-manager/public/1/1%20Text%20Complexity%20Greer%20Deshler.pdf

88 Manchester, J. (2022, February 3). Conservative groups roll out ad hitting Democrats over masks, school closures. *The Hill*. Retrieved January 10, 2023, from https://thehill.com/homenews/campaign/592561-conservative-groups-roll-out-ad-hitting-democrats-over-masks-school/

89 Teräs, M., Suoranta, J., Teräs, H., & Curcher, M. (2020). Post-COVID-19 education and education technology "solutionism": A seller's market. *Postdigital Science and Education, 2*(3), 863–878. Retrieved August 26, 2022, from https://link.springer.com/content/pdf/10.1007/s42438-020-00164-x.pdf

90 Nespor, J. (1997). *Tangled up in school: Politics, space, bodies, and signs in the educational process*. Mahwah, NJ: Lawrence Erlbaum and Associates.

NEPC
NATIONAL EDUCATION POLICY CENTER

Section III

Key Policy Issues in Virtual Schools: Finance and Governance, Instructional Quality, and Teacher Quality

Luis Huerta, Teachers College, Columbia University
Jennifer King Rice, University of Maryland
Amanda Glover, Teachers College, Columbia University
Kayla Bill, University of Maryland

May 2023

Executive Summary

This section draws from a comprehensive analysis of all proposed and enacted virtual school legislation in 50 states during the 2021 and 2022 legislative sessions, building on earlier NEPC reports detailing nine years of activity in the 2012-2020 sessions. We focus on whether legislatures have been moving closer to or further from core recommendations advanced in this NEPC series and whether this or other relevant research is informing legislative action.

Our analysis revealed a continued decrease in activity, although bills attempting to increase oversight continue to be proposed. We found little evidence to indicate that emerging research is informing legislative action. This section also analyzes bills specific to state responses to the COVID-19 health emergency in the 2021 and 2022 legislative sessions.

Based on this review and analysis, it is recommended that policymakers:

- Develop new funding formulas based on the actual costs of operating virtual schools.
- Develop new accountability structures for virtual schools, calculate the revenue needed to support them, and provide adequate funding.
- Establish geographic boundaries and manageable enrollment zones for virtual schools by implementing state-centered funding and accountability systems.

- Develop guidelines and governance mechanisms to ensure that virtual schools do not prioritize profit over student performance.
- Require high-quality curricula, aligned with applicable state and district standards, and monitor changes to digital content.
- Assess the contributions of various providers to student achievement, and close virtual schools and programs that do not contribute to student growth.
- Implement a nationwide longitudinal study across multiple providers and with interim checkpoints to assess the quality of the learning experience from the student perspective.
- Delineate the definitions of adequate quantity of instruction to ensure subject mastery.
- Define certification training and relevant teacher licensure requirements specific to teaching responsibilities in virtual schools, and require research-based professional development to promote effective and equitable online teaching.
- Address retention issues by developing guidelines for appropriate student-teacher ratios and attending to other working conditions (for example, student attendance and engagement) that may affect teachers' decisions about where to work.
- Work with emerging research to develop valid and comprehensive teacher evaluation rubrics and accountability systems specific to online teaching that reflect important elements of virtual teaching like differentiated instruction, student engagement, and equitable support of all learners.
- Identify and maintain data on teachers and instructional staff that will allow education leaders and policymakers to monitor staffing patterns and assess the quality and professional development needs of teachers in virtual schools.
- Examine the work and responsibilities of virtual school administrators and ensure that those hired for these roles are prepared with the knowledge and skills to be effective, particularly with respect to evaluating teachers and promoting best practices.

NEPC
NATIONAL EDUCATION POLICY CENTER

Section III

Key Policy Issues in Virtual Schools: Finance and Governance, Instructional Quality, and Teacher Quality

Luis Huerta, Teachers College, Columbia University
Jennifer King Rice, University of Maryland
Amanda Glover, Teachers College, Columbia University
Kayla Bill, University of Maryland

May 2023

Introduction

As evidenced in the NEPC series of policy reports on virtual schools, policymakers continue to struggle to reconcile funding structures, governance and accountability systems, instructional quality, and staffing demands developed for traditional brick-and-mortar schools with the unique organizational models and instructional methods associated with virtual schooling. State legislatures continue to respond to inherent challenges, partly by proposing bills intended to increase oversight; however, only 24% of proposed bills were enacted in 2021 and 2022.[1] In addition, little evidence suggests that emerging research is informing legislative actions.

Below we revisit critical policy issues introduced in our earlier reports, specifically:

- Finance and governance
- Instructional quality
- Teacher quality

Beginning with the 2013 NEPC report, we defined these areas and began surveying emerging research relative to them; then, in the 2014 report, we shifted our focus to legislative activities, characterizing how states were addressing evolving virtual school models. The last five reports have analyzed legislation, examining all proposed and enacted virtual school legislation in 50 states from 2012 through 2020. Early analysis of 2012 and 2013 bills served as a

baseline allowing us to identify and track more recent trends, up to and including the comprehensive analysis of all virtual school legislation introduced in 2021 and 2022, presented here.

We also include analysis specific to bills responding to the COVID-19 crisis in the 2021 and 2022 legislative sessions, building on similar bills that were first introduced in 2020 during the early stages of the COVID-19 pandemic. In addition, we draw on our research, recent policy reports, and popular press accounts. To provide context, we reintroduce and update critical policy issues, relevant assumptions, and unanswered empirical questions. To conclude each subsection, we advance policy recommendations and offer thoughts on the next steps for researchers and policymakers.

Overview

Our nationwide, comprehensive analysis of all 2021 and 2022 proposed and enacted virtual school legislation drew on the FiscalNote Bill Tracking Database. Keywords searched were: cyber, virtual, online, technology, non-classroom-based, distance learning, digital learning, and blended learning.[2] Our analysis sought bills targeting new, revised, or revoked programs specific to K–12 virtual education. This analysis provides a richer understanding of how legislators are promoting, revising, and curbing evolving virtual school models compared to previous years. In addition, analysis of nine earlier legislative sessions allowed us to track whether legislative trends are moving closer to or further from our earlier recommendations.

We found that in 2021, 44 bills were proposed in 19 states: 13 were enacted, 27 failed, and four were pending (See Appendix III-A for a comprehensive listing and summaries of relevant bills.) In 2022, 55 bills were considered in 27 states: 11 were enacted, 37 failed, and seven are pending. In total, 30% of bills proposed in 2021 and 20% proposed in 2022 were enacted. (See Appendix III-B for a comprehensive listing and summaries of relevant bills.) The raw number of bills introduced remains consistently low since the 2018 legislative session, when we assessed a significant drop and only 42 bills were introduced. In comparison, during the 2012–2017 legislative sessions, an average of over 110 bills were introduced each year.[3] However, as detailed momentarily, the focus on specific themes has remained constant since 2012.

In 2021, 19 states considered legislation, and 10 enacted at least one bill. Much of the activity occurred within a relatively small number of states: Pennsylvania (8), Oklahoma (6), and Texas (6). In 2022, 27 states considered legislation and 11 states enacted at least one bill. Again, very few states accounted for most activity: Florida (7), Wisconsin (6), Oklahoma (4) and Missouri (4). Consistent with findings in earlier reports, Pennsylvania and Oklahoma continue to see significant activity.

Typically, proposed legislation ranged from narrow to sweeping. Two trends were significant and continuing from previous years, and one trend that was previously noted as newly emerging experienced a substantive decrease in legislative activity. As in the past, many bills targeted funding issues, including costing-out virtual school models, proposals to reduce funding, and proposals to curb profiteering. Also, like in prior years, in the 2021 and 2022

legislative sessions a body of substantive legislation indicated an interest in topics generally related to governance: pilot programs, task forces, oversight commissions, and state boards to study and oversee virtual schools. Some bills, not surprisingly, couple both governance and finance, as when a task force might have been proposed to investigate a particular funding issue. A third trend specific to moratoriums or closures of virtual schools that we noted as newly emerging in the 2019 and 2020 legislative sessions is that they experienced a sharp decrease. Moratorium bills had increased significantly in the 2019 and 2020 legislative sessions, when eight bills were introduced, but in 2021 and 2022, zero moratorium bills were proposed. Another notable area where interest has been fading recently is in bills related to cybersecurity and student data privacy issues: Only one was introduced in 2021.[4]

The COVID-19 pandemic has had a significant impact on legislation related to full-time virtual schools. Compared to bills in the 2020 legislative session that addressed the issues of instructional and teacher quality in the context of a health emergency and nationwide school closures, new bills in 2021 and 2022 focused primarily on interventions for addressing students' learning loss during the COVID-19 pandemic.

Appendix III-A and III-B highlight the main themes covered by select bills. The following subsections analyze the substance of select bills, with a focus on states exhibiting significant legislative activity and bills that address three critical policy areas—finance and governance, instructional quality, and teacher quality. Each subsection concludes with an assessment of how legislative developments during the past 11 years have moved policy closer to or further from addressing the critical policy issues outlined in our recommendations.

Finance and Governance

Despite increased attempts to identify funding, governance, and accountability mechanisms to strengthen oversight of virtual schools, policymakers and practitioners continue to face challenges in these areas. Legislatures continue to advance bills proposing task forces and boards to oversee implementation challenges, although there is limited evidence concerning how and whether such attempts have been informed by the findings and recommendations of past task forces, state studies, and empirical research. There is, however, substantive evidence that state audits and legal challenges have prompted continued efforts to improve accountability and governance structures and to address profiteering.

Linking Funding to Actual Costs of Virtual Schools

To date, and despite many attempts to enact legislation addressing funding issues, no state has implemented a comprehensive formula that ties funding allocation directly to virtual schools' actual costs and operating expenditures. Policy debates persist, both because of cost differences between virtual and brick-and-mortar schools and because of other policy considerations. Developing a comprehensive formula would involve gathering sound and complete data on virtual schools' costs and expenditures related to governance, program offerings, types of students served, operational costs, student-teacher ratios, and other fac-

tors. As in previous reports, our exhaustive search on this topic has not found an empirical study that accounts for the true cost differentials of brick-and-mortar and virtual schools.[5] However, new evidence shows states attempting to develop a more methodical funding approach through directives for task forces and state studies to provide policymakers with reliable data to guide their decisions. Proponents of more finely tuned funding include charter school advocates, who have called for legislatures to align per-pupil funding with the actual costs of educating virtual school students.[6]

As in past years, and as new task forces and oversight committees have begun studying cost differentials, legislation has been introduced—and in some instances, enacted—to revise virtual school funding. Policymakers' sustained attention to virtual school funding makes clear that funding is a key concern. However, compared to previous years, there has been a decrease in calls for costing-out studies or similar interventions. For example, in past years, the Pennsylvania legislature has consistently been a frontrunner in attempts to calibrate funding formulas as virtual charter schools have grown. In addition to past support from the governor, who has repeatedly called for changes in funding formulas for all charter schools,[7] the Pennsylvania Auditor General has also recommended developing new systems to increase accountability for virtual charters and to eliminate incentives for profiteering.[8] Yet, in the 2021 and 2022 legislative sessions, Pennsylvania introduced only one bill (PA HB 1688, 2021) calling for costing-out the operations of cyber charter schools and determining the actual cost of educating students. The Pennsylvania legislature had also previously advanced several bills calling for moratoriums on new cyber charter schools; however, zero moratorium bills were proposed in 2021 or 2022.[9]

This decrease in bills calling for oversight of cyber charter schools in Pennsylvania is coupled with a recent decision by newly elected Auditor General Timothy DeFoor to close the school audit bureau.[10] DeFoor's rationale for the closure cited how the responsibility to audit schools is that of the Pennsylvania Department of Education.[11] The Children First Pennsylvania Charter Performance Center, a group that advocates for quality public education, levied a strong protest to DeFoor's decision, citing the mismanagement of public revenues and profiteering by cyber charter schools in Pennsylvania. The group outlined how DeFoor's predecessor had revealed in two previous audits the unusually large year-end funding reserves many cyber charter schools had amassed. They explain how in 2021, Pennsylvania Cyber Charter School reported over $63 million in reserves, and Reach Cyber Charter School reported over $31 million.[12] As has consistently been the case in recent Pennsylvania legislative sessions, all bills related to funding or governing issues in cyber charter schools have failed.

Costing-out was also of interest in other states, including Arizona and Kansas, during 2021 and 2022. In Arizona (AZ HB 2426, 2022), the legislature proposed that the State Auditor General "conduct and complete a cost study of Arizona online instruction in this state."[13] The comprehensive study would have examined administration, technology, personnel, and curriculum costs, the percentage of online courses taught by humans, how much is spent on each online course, the average online class size, how much money Arizona generates for online students, and how money follows online students to their school of attendance. The bill failed to pass. In Kansas, one bill (KS HB 2134, 2021) proposed a study of statewide virtual school programs in other states that would examine "the aggregate cost incurred by each

state in administering a virtual school program, and the cost incurred by individual school districts or schools."[14] The study would also account for the cost of resources necessary for the implementation of virtual school programs, including personnel, equipment, software, and facilities, in addition to measuring student performance in each virtual program. The bill was enacted.

While interest in adjusting funding based on real costs continues, little evidence suggests that policymakers are drawing on either the results from their own state studies or on evidence emerging from other research. Absent a wider empirical accounting of real costs, legislative proposals seem likely to continue to be fueled more by political motivation than by reliable evidence.

Identifying Accountability Structures

Governance accountability structures should ensure that all virtual school expenses and practices directly benefit students. Concerns include monitoring costs and quality of staff, materials, and instructional programs—including technological infrastructure, digital learning materials, paraprofessional services, and third-party curriculum. Oversight of other areas, such as student attendance and learning transcripts, allows monitors to evaluate instructional time and outcomes. The new trend in proposed bills linking per-pupil funding to student performance persists in 2021 and 2022, with the addition of termination of virtual school contracts when specific standards of student enrollment and school performance are not met.

For example, a bill in Texas (TX SB 15, 2021) proposed that a school district may not count a virtual student in their average daily attendance (ADA) if the student:

> 1. did not achieve satisfactory performance or higher or the equivalent in the preceding school year; 2. had a number of unexcused absences that exceeds 10 percent of the number of instructional days in the preceding school year; or 3. did not earn a grade of C or higher or the equivalent in each of the foundation curriculum courses taken virtually or remotely.[15]

The same bill also included a requirement that schools earn an overall performance rating of C or higher as a condition for operating a remote learning program. The bill passed.

In Florida (FL HB 5101, 2022) a bill would have required that virtual school providers receive both a statewide and school-level performance grade based on the academic assessment scores of the students they serve. If a provider received two consecutive grades of "D" or "F," their contract would be terminated. A similar bill in West Virginia (WV HB 2576, 2022) would have required an annual evaluation that includes assessing student performance and fiscal and operational viability. Both bills failed.

In contrast to the bills outlined above that would have increased the accountability of virtual schools, a bill enacted in Georgia (GA HB 2115, 2022) repealed the requirement for audit reports on virtual charter schools. Specifically, the Georgia Department of Audits and Controls would previously prepare an audit every four years, in the period before a charter

was due for reauthorization. The audit included academic performance, financial data, and governance data. The new law eliminates this important accountability audit.

Delineating Enrollment Boundaries and Funding Responsibilities

Monitoring which virtual schools provide education services, and to which students, requires addressing capacity issues and delineating enrollment zones. Careful enrollment audits are also necessary to ensure that a student's resident district is forwarding appropriate local and state per-pupil allocations to a virtual school. Several bills in this analysis address these issues.

A new legislative trend that we identified in 2019 and 2020 was efforts to adjust virtual schools' enrollments or limit their growth. Legislatures have sought to cap or limit enrollment to address issues specific to both accountability and cost. Interestingly, in the 2021 and 2022 legislative sessions, an opposite trend emerged, where six bills called for lifting enrollment caps and expanding access to virtual schools, and only one bill called for limiting virtual school enrollment. Four enacted bills will lift the statutory cap on the number of virtual schools or virtual school enrollment in Wisconsin (WI SB 828, 2022), North Carolina (NC HB 196, 2021; NC HB 103, 2022), and Florida (FL HB 5003, 2022). In North Carolina, the two enacted bills will lift the statutory limit on enrollment in two pilot-program virtual charter schools (NC HB 196, 2021) and extend the pilot program through the 2024-25 academic year (NC HB 103, 2022). In Florida (FL HB 5003, 2022), conditional approval for virtual school providers will be extended from one to two years. And in Wisconsin (WI SB 828, 2022), providers will be allowed to extend their pilot for an online early learning pilot program for children from low-income households who reside in school districts other than those included in the original pilot program. Three similar bills, in Maine (ME SP 168, 2021; ME HP 310, 2021) and Alabama (AL HB 506), proposed lifting enrollment caps in virtual schools; all three bills failed. The only bill that proposed a limitation on virtual school enrollment was in Maryland (MD HB 805, 2022), which would have restricted a virtual school from enrolling more than 1% of school-age children in any county. The bill failed.

In addition to the substantive number of bills that proposed lifting enrollment caps, seven bills called for creating new virtual school programs, including pilot programs and statewide acts.[16] This sharp increase in bills calling for expanding virtual school operations may be related to the COVID-19 health emergency, where state efforts to codify virtual school operations as all students transitioned to full-time remote learning were necessary. However, without engaging in further analysis of local conditions that motivated these policy changes, it is difficult to claim a causal effect.

As in previous years, legislative proposals on enrollment boundaries and limits persisted in 2021 and 2022. Delineating enrollment zones has proven challenging for students' resident districts, which must send tuition payments to virtual schools that may be geographically distant, complicating verification of student enrollment. However, consistent with the trend identified in the subsection above, where legislatures advanced more permissive regulations lifting enrollment caps and expanding access to virtual schools, we also see an increase in

bills advancing more permissive enrollment boundaries.

Previous efforts by state legislatures to address enrollment boundaries and limits have consistently failed. For example, in Florida (FL HB 5101, 2022), a proposed bill would have limited the proportion of full-time equivalent virtual students residing outside of a school district that already provides virtual instruction to no more than 50% of the total enrolled full-time equivalent virtual students residing inside the school district that provides the virtual instruction. In Texas (TX SB 27, 2021), a proposed bill would have restricted a district or charter school from counting a student on their average daily attendance if they do not reside in the district or the geographic area served by the charter school. And in Oklahoma (OK SB 630, 2021), a proposed bill would have allowed a student's resident school district to deny a transfer if the resident district already offers a full-time virtual education program equal in scope and content to the virtual charter school to which a transfer is being sought. All three bills failed.

In contrast to bills that have attempted to define stricter enrollment boundaries, four proposed bills sought to expand or erase enrollment boundaries, allowing non-resident students to attend a virtual school in a district where they do not reside, in Nevada (NV AB 329, 2021), Oregon (OR HB 4119, 2022), Texas (TX SB 15, 2021), and Wisconsin (WI SB 109, 2021). The bills in Texas and Wisconsin were enacted.

Lastly, in Pennsylvania (PA HB 1074, 2021), a proposed bill aimed to limit cyber charter schools from drawing enrollment from all districts in the state. It would have required students to pay a full tuition charge if they chose to enroll in a cyber charter outside their district of residence, if their resident district already offered a full-time cyber education program. The bill failed.

The bills to slow or control the scaling-up of virtual schools and limit enrollment boundaries are examples of attempts by policymakers that are consistent with our reports' recommendations. However, the newly emerging trends to lift enrollment caps, expand access to virtual schools by eliminating enrollment boundaries, and develop new state-level virtual programs may challenge the ability of policymakers to hold virtual schools accountable. In past reports, we found that studies of virtual school accountability structures done via task forces or commissions to inform policy were becoming more common. Charged with identifying best practices for governance and delivery of online instruction, such publicly funded study groups may yield important information for policymakers and practitioners. We recommend that states continue engaging in these types of studies before further expanding virtual school options.

Limiting Profiteering by Education Management Organizations

In 2021 and 2022, legislators in several states have continued to respond to the complicated accountability issues and public controversies related to for-profit education management organizations (EMOs). These organizations provide various products and services to virtual schools—including software and curriculum, instructional delivery, school management, and governance. As outlined in Section I of this report, virtual schools that have contracts

with for-profit EMOs operated 32% of all virtual schools and served 52% of full-time virtual school student population. Stride, Inc. (formerly K12 Inc.)[17] continues to be the largest of the for-profit virtual school providers, operating 78 schools and serving 134,525 students in 2021-2022—amounting to 23% of the estimated 578,659 full-time virtual school students in the U.S. Stride, Inc. profits in 2021 were a net $161 million, and total revenues were $1.54 billion.[18] Profits in 2022 were a net $188 million and total revenues were $1.69 billion,[19] compared to a 2020 net profit of $56.1 million and total revenues of $1.04 billion.[20]

Slack accountability and the perverse motivation of for-profit virtual school operators to capitalize on minimal state oversight have encouraged widespread profiteering and continually prompted calls for action. As a result, audits conducted by state legislative analyst offices and auditor generals, either mandated by law or prompted by public calls for accountability, have triggered legal and policy challenges for both policymakers and law enforcement. In recent years, profiteering in California, Ohio, and Pennsylvania has been an especially contentious issue for legislatures.[21] For example, ongoing audits by Pennsylvania's Auditor General have resulted in several school closures and criminal convictions of former virtual school operators—but past legislative efforts to curb damaging practices have consistently failed.[22]

As discussed above, the recent closure of the school audit bureau within the Office of the Auditor General in Pennsylvania may further limit policymakers' attempts to hold cyber charter schools accountable. Past proposals in multiple states have routinely failed, indicating the intransigence of the problem, although earlier, California did enact a bill including restrictions on for-profit EMOs operating virtual charters,[23] and Ohio did enact one with new procedures for determining full-time equivalency, defining student attendance, and defining learning engagement.[24] In 2021 and 2022, two similar bills were proposed that would have restricted for-profit management organizations from applying for or renewing a virtual charter school application (Oklahoma, OK SB 665, 2021) and prohibiting districts from contracting with a for-profit provider to operate a virtual school (Maryland, MD HB 1163, 2022). Both bills failed.

Several states tried to improve monitoring in other areas of virtual school operations. Some proposed bills spelled out minimum requirements for what "counts" as attendance and engagement, collectively known as "seat time" or login records used to calculate per-pupil revenue disbursements. Three bills (Ohio, OH HB 110, 2021; West Virginia, WV HB 2576, 2022; Oklahoma, OK HB 3645, 2022) proposed a minimum number of contact or instructional hours equivalent to state requirements for students in brick-and-mortar classrooms that virtual students must fulfill to count as full-time under average daily attendance guidelines. Only the bill in Ohio was enacted. In Michigan (MI SB 845, 2022), a proposed bill provided extensive guidance on defining activities that constitute "participation" by a virtual school student. The requirements define participation on "pupil membership count days," which includes: attendance at a live lesson with a teacher; documentation of login for the lesson with a teacher; documentation of email dialogue between the student and teacher; documentation of work completed with teacher or coach during the lesson; and additional two-way interaction three weeks after the pupil membership count day.[25] The bill was enacted.

While these three bills provide needed additional guidance, they do not close the gaps asso-

ciated with over-reporting full-time enrollment and under-defining learning engagement, the practices that have fueled profiteering by virtual school providers in many states.

Another persistent trend specific to issues of profiteering is a concern for governance structures and conflicts of interest. As in previous years, the Pennsylvania legislature proposed the most comprehensive bill in this area. The bill (PA SB 1, 2022) was an attempt to expand the requirement for public audits of charter and cyber charter schools' boards of trustees, including:

1. An enrollment test to verify the accuracy of student enrollment and reporting to the Commonwealth.
2. Full review of expense reimbursements for members of the board of trustees and administrators, including the sampling of each reimbursement.
3. Review of internal controls, including review of receipts and disbursements.
4. Review of annual Federal and State tax filings, including the Internal Revenue Service Form 990, Return of Organization Exempt from Income Tax, and each related schedule and appendix for the charter school entity and charter school foundation, if applicable.
5. Review of the financial statements of any charter school foundation.
6. Review of the selection and acceptance process of each contract publicly bid.
7. Review of each board policy and procedure with regard to internal controls, code of ethics, conflicts of interest, whistle-blower protections, complaints from parents or the public, compliance with 65 Pa.C.S. Ch. 7 (relating to open meetings), finances, budgeting, audits, public bidding, and bonding.[26]

The bill also prohibits a charter school administrator from receiving compensation from another charter school or a company that provides management or other services to another charter school. And finally, in attempts to curb nepotism within school administration, the bill describes:

> An individual may not serve as a voting member of the board of trustees of the charter school or regional charter school if the individual or a family member receives compensation from or is employed by or is a member of the local board of school directors who participated in the initial review, approval, oversight, evaluation or renewal process of the charter school or regional charter school chartered by that board. An administrator of a charter school entity or family member of the administrator may not serve as a voting member of the board of trustees of the charter school entity that employs the administrator.[27]

Consistent with previous legislative attempts to hold cyber charter schools accountable in Pennsylvania, the bill failed.

The financial or material inducements offered by virtual schools in attempts to increase en-

rollment have also been a source of profiteering. In Kansas (KS HB 2649, 2022), a proposed bill would have expressly prohibited virtual schools from offering financial incentives for a student to enroll in a virtual school. And in Pennsylvania (PA SB 1, 2022), a proposed bill would have prohibited efforts by cyber charter schools to increase enrollments with paid advertising and prohibited calling "the cost of tuition or other services, including transportation, computers, Internet or other electronic devices" free expenses.[28] Instead, cyber charters would be required to explicitly describe how the costs are paid for with taxpayer dollars. Both bills failed.

Legislative proposals have yet to resolve the need for accountability structures that effectively eliminate profiteering. Yet, a few efforts have succeeded. The proposals advanced in many of the bills outlined above are consistent with our recommendation calling for a policy or other actions by public officials to ensure that for-profit virtual schools do not prioritize profit over student performance.

COVID-19

Under the heading on enrollment above, we highlighted two new trends in proposed bills related to full-time virtual schools that advanced more permissive regulations lifting enrollment caps, expanding access to virtual schools through new programs, and proposing more permissive enrollment boundaries. We explained how the increase in these types of bills might be related to expanding virtual school access during the COVID-19 health emergency. A similar trend is apparent in bills that focus on virtual learning but are not explicitly aligned with full-time virtual schools. Five proposed bills called for either new virtual school programs, the expansion of existing programs, or elimination of statutory geographic boundaries and enrollment caps that limit more expansive virtual schooling.[29]

Another legislative trend, which we will highlight in the subsections below, is the numerous proposed bills that called for the mitigation of learning loss by students during the COVID-19 pandemic. In total, eight proposed bills allocated funding for studying and developing interventions to address learning loss.[30]

Recommendations to Ensure Effective Funding and Governance Mechanisms

While some state legislators have made efforts to address the important finance and governance challenges of operating virtual schools, a need remains for additional research to identify funding and governance practices that will increase accountability, identify cost-effective best practices, and eliminate profiteering. Given the evidence detailed above, we reiterate our recommendations from previous reports. Specifically, we recommend that policymakers and educational leaders:

- Develop new funding formulas based on the actual costs of operating virtual schools.
- Develop new accountability structures for virtual schools, calculate the revenue need-

ed to support them, and provide adequate funding.

- Establish geographic boundaries and manageable enrollment zones for virtual schools by implementing state-centered funding and accountability systems.
- Develop guidelines and governance mechanisms to ensure virtual schools do not prioritize profit over student performance.

Ensuring Instructional Program Quality

Since the onset of the COVID-19 pandemic in 2020 and the abrupt switch to remote and online learning for many, there has been a notable increase in the number of virtual schools and virtual school students. As outlined in Section I of this report, virtual school enrollment increased by 174% from 2019-20 (pre-pandemic) to 2021-22. Across 2021-22, while most students and schools returned to brick-and-mortar settings and resumed traditional face-to-face instructional methods, more families have opted into continuing online learning,[31] making the connection more critical than ever between instructional quality of virtual education and requisite policies that govern quality. While education has yet to realize the full impact of the pandemic on instruction, it is clear that the substantial increase in K–12 full-time virtual students calls for a closer look at instructional quality practice and policy nationwide.

The increase in virtual school enrollment in recent years should communicate to state policymakers that virtual instructional quality and the means by which student achievement is assessed across virtual schools should be a renewed priority. In many states, virtual charter schools experienced more enrollment growth than brick-and-mortar charter schools.[32] In some cases, virtual schools—especially in the case of the Florida Virtual School, as this report has discussed at length in the past—offer more than 190 flexible course options for full-time K–12 students. While the proportion of full-time virtual school students is still small in comparison to brick-and-mortar school students, hundreds of school districts established virtual schools in the 2020-21 school year, turning what was meant to be a temporary instructional solution during the pandemic into districts possibly responding to some families' desire to continue online instruction permanently.[33]

It is critical to ensure that the increasing number of virtual students are engaging in high-quality curriculum and that their virtual schools are being held to the same performance standards of education as their brick-and-mortar school counterparts. Further, compounded by early reports of learning loss experienced by many students during the pandemic disruption,[34] assessing achievement and the quality of instruction holds even more importance. Improving methods to meaningfully monitor virtual school performance and student achievement will ensure that remote academies and digital learning alliances, for example, have the capacity to serve every student.

The virtual learning experience, and instructional quality specifically, can vary significantly.[35] The varied approaches to virtual school instruction can make oversight even more difficult from a policymaking standpoint. Previous versions of this report have revealed mini-

mal legislative activity on instructional quality and other state oversight of virtual schools. The risk of increasing the scope of virtual education so quickly without sufficient legislative oversight could exacerbate concerns about the lack of high-quality instruction in full-time virtual programs. Some virtual schools' instruction has resulted in poor results for many students, and without the proper instructional oversight and student performance monitoring, the online challenges that contributed to learning loss during the pandemic could persist.[36]

As enrollments rise, the very small number of legislative bills seeking to improve instructional quality that were introduced or passed during 2021 and 2022 reflect a missed opportunity for policymakers to focus on virtual instruction. In this report, six bills were tracked related to full-time virtual school instructional quality across six states, resulting in only two enacted laws. One failed bill, introduced in response to the pandemic, sought to improve instructional quality and combat learning loss by offering virtual learning programs. Compared to 2019 and 2020, 10 bills were filed to ensure instructional quality, with only one enacted across five states. The decline in bills filed on this topic, while virtual student enrollment is climbing and states are still addressing learning loss, is deepening the legislative gap between virtual school growth and instructional quality.

Quantity and Quality of Instruction

The variation in the quality of K–12 virtual programs, including the design and delivery of the virtual instruction, could be a contributing factor to explaining how evaluations of student performance often result in mixed findings.[37] The quality of instruction in a virtual school, similarly to the quality of instruction in brick-and-mortar schools, is one of the most predictive factors in a program's success and how meaningful the virtual learning experience will be for its students.

The National Standards for Quality (NSQ) Online Learning, once affiliated with iNACOL, now collaborates with the Virtual Learning Leadership Alliance, Quality Matters, and the Digital Learning Collaborative. The purpose of providing oversight is to provide a multi-perspective approach to ensuring that virtual learning standards are current and relevant.[38] NSQ has identified critical standards to guide the high-quality delivery of virtual instruction, including curriculum and course design and instruction, fundamental contributors to ensuring full-time virtual students receive quality instruction. Some select standards that are important to note for this discussion around virtual school instructional quality are:

NSQ Standard: Instruction[39]

- The program adopts clear expectations for curriculum design and teaching practices that align with its stated vision, mission, principles, or values.
- Instruction is guided by evidence-based practices.
- Instruction is inherently inclusive for all learners.
- The program implements strategies to ensure the academic integrity of course assign-

ments and assessments in order to increase student accountability.

NSQ Standard: Curriculum and Course Design[40]

- Courses included in the program integrate quality instructional materials to enable and enrich student learning.
- Courses included in the program contain content that aligns with appropriate learning standards and includes provisions for both intervention and accelerated learning opportunities.
- Courses included in the program provide a variety of activities that include options for in-depth learning through authentic problem-solving and experience.
- Courses offered through the program are designed using research-based design principles, such as Universal Design for Learning (UDL), that improve access to learning for all participants.

Virtual school instruction curriculum and coursework can be delivered asynchronously or synchronously, accessible in real time and usually delivered by a virtual schoolteacher.[41] While approximately 70% of virtual charter schools deliver instruction completely asynchronously, 9% still require in-person check-ins with a certified teacher. Aligned with the NSQ standards, asynchronous learning in virtual schools can accommodate students who desire to work on course content at their own pace and is a good fit for families with multiple virtual learners in one household, sharing technology and coordinating schedules.[42] Although this method of delivering content can meet the needs of some students, online environments that fail to offer any synchronous interaction with instructors can result in lower performance, where completely asynchronous instruction can struggle with fostering learning.[43]

Some virtual schools can offer courses to students that may not be available to under-resourced brick-and-mortar schools, which often face challenges with teacher recruitment that limit course access, especially for advanced and remedial offerings. For example, career and technical courses, elective courses in specialized fields, and other courses that cater to the individual learning needs of students are available online through district virtual schools.[44] The Rural Virtual Academy Charter School Inc. (RVA) in Wisconsin, for example, has grown its course offerings to more than 6,500, more than double its repertoire in 2018-19.[45] Importantly, RVA has fostered a partnership with the Wisconsin eSchool Network and is part of a consortium of school districts that vet and purchase quality digital content with the Wisconsin Department of Public Instruction and must match curriculum with the Wisconsin State Academic Standards. This partnership—established to secure both the quantity of courses available and quality instruction aligned to state standards that impact both virtual and brick-and-mortar school students—is an ideal statewide collaboration.

Our analysis of the 2021 and 2022 virtual school legislation related to instructional quality revealed only three bills speaking to the quality of instruction. In 2021, an Alaska bill (AK SB 42) would have required the state department of education to review the curriculum of a virtual education course before it is included in a database making it available to students in

grades 6 through 12, contingent on an approval process that would require the curriculum to be aligned with the state standards. Despite failing, this bill is an important indicator that oversight of instructional quality in virtual instruction is a concern of some Alaska legislators. In 2022, Maryland also attempted, but failed, at passing legislation (MD HB 1163) that would have required their state department of education to establish virtual school standards that included reporting program quality metrics, the tracking and use of student data, and data reporting requirements. Lastly, Idaho enacted a bill (ID H 788, 2022) that required the Idaho Digital Learning Academy to provide remedial and advanced coursework opportunities to virtual students, including dual credit courses.

Assessing Achievement

The two types of instructional quality bills that this report analyzed—quantity and quality of instruction, and assessing achievement—are closely linked. As noted earlier in this report, full-time virtual school academic performance overall continues to be negative. As reported in Section I of this report (See Tables 6 and 7), in 2021-22, only 41.2% of full-time virtual schools earned acceptable performance ratings, and graduation rates for all virtual school students were more than 21% points below the national average. Without high-quality instruction, full-time virtual students will not receive the support necessary to accelerate their learning and overall performance of virtual schools will continue to lag behind.

Like curricula in brick-and-mortar schools, online curricula should be aligned with a designated set of standards to ensure that students' online learning experiences provide the information and skills policymakers deem essential. In fact, a 2015 report asserted that "All states have included specific language to require that online school curricula align with state standards and assessments. This may be in response to the fact that many online charter providers operate across many states with different learning standards."[46] The emphasis on alignment with a designated set of standards is also reflected in the National Standards for Quality (NSQ) Online Learning for Assessment and Learner Performance, outlined by the following standards:[47]

- The program uses multiple methods to assess the degree to which stated learning goals are met.
- Formative assessments that provide data for targeted remediation or intervention when needed are included.
- Assessments are aligned with learning objectives.
- The program provides standards for timely, effective feedback as an integral role of assessment.

The independent curriculum pacing and mastery-based instructional methods of virtual instruction may provide full-time virtual students with options in their learning and the opportunity to pursue remedial and advanced coursework. However, the inherent flexibility of online education and the need for consistent performance evaluations may complicate the process of creating reliable assessments. Many virtual schools, including the Florida Virtual

School, provide students with multiple opportunities to demonstrate mastery of content before moving on to the next course.[48] Assessment of student achievement can become more complicated with mastery-based systems, and documenting student proficiency becomes a primary concern.

A closer look at statewide longitudinal data systems and methods for assessing virtual school accountability would create shared oversight and mechanisms for monitoring instructional quality. In Tennessee, virtual schools are evaluated by the district that establishes them, with the intent to examine how the virtual school demonstrates an increase in student achievement in accordance with state academic standards.[49] The Tennessee Department of Education, for example, practices a virtual school monitoring framework that outlines monitoring requirements and how to designate virtual schools by performance. Annually, a virtual school's evaluation must include the accountability and viability of the school, demonstrated by several components, including academic performance.[50] An oversight system contributing to virtual school monitoring strengthens reflection on virtual school practices and allows school districts to keep student achievement front of mind.

In 2022, only three bills addressed assessing student achievement in virtual schools. In Florida, full-time K–12 virtual school students are already required to participate in the state assessments, but a bill that failed to pass (FL HB 1193) also sought to require participation in a coordinated screening and progress-monitoring system to be delivered at least three times annually. West Virginia also failed to pass a bill (WV HB 2576) that would have amended its existing Virtual Public Schools Act to add annual evaluations of virtual schools. New evaluation metrics would have included the extent to which the virtual school increases student achievement related to state academic standards and a minimum requirement of 900 hours of learning opportunities or demonstrated mastery of content. Missouri, however, successfully passed legislation (MO HB 1552) that shifted responsibility from their state department of education to virtual school programs to monitor student success and to provide the host school district with progress reports on academic and other relevant aspects of student engagement.

COVID-19

When the pandemic entered schools in 2020, the phrase "emergency remote teaching" was coined to describe the swift shift in modality, even though the term "online learning" was being used to describe the instruction offered to students learning from home.[51] The different phases of education in response to COVID-19 began with a "rapid transition to remote learning and teaching"; we have now potentially entered the last phase, "emerging new normal," in which the levels of online learning adoption—likely to be higher than before the pandemic—are still unfolding.[52]

What has become clearer since the transition to online learning from the pandemic has been the lack of understanding of virtual instruction practices experienced by students who learned remotely during COVID-19 and for those still learning online today.[53] More than half of K–12 public school teachers reported that their students suffered significant academic

and social-emotional learning loss, especially among Black and Hispanic students and students with disabilities.[54] For many students, returning to a brick-and-mortar school setting was critical, as the emergency remote learning settings were not yet equipped to deliver quality virtual instruction.

After the pandemic dust had somewhat settled, only one bill was introduced in 2022—in Rhode Island (RI HB 7284, pending at the time of this analysis)—that proposed appropriating $250 million from federal Elementary and Secondary School Emergency Relief (ESSER) funds to create an online system of supplemental courses aimed to address academic deficiencies in student performance after the COVID-19 pandemic. Importantly, the legislation specifies that the funds should be used to purchase high-quality curricula from virtual learning programs and offer testing and diagnostic resources to identify areas needed for targeted remediation. To provide further support to families recovering from the pandemic, this bill would require the state department of education to prepare individuals to support parents as their students register for online courses to address remediation, with access to summer learning programs and certified teacher mentorship. This bill would support all Rhode Island students, including those enrolled in brick-and-mortar schools.

Recommendations to Ensure Instructional Quality

The legislative activity focused on the instructional quality delivered by virtual schools has not matched the growth in virtual school enrollment. We continue to see less legislative activity, as evident from our analysis of 2021 and 2022 legislation. Similar to the last NEPC Virtual Schools report in 2021, little progress has been made across states to ensure instructional quality. Based on the preceding analysis, we reiterate our recommendations from the previous reports. Specifically, we recommend that policymakers and educational leaders:

- Require high-quality curricula, aligned with applicable state and district standards, and monitor changes to digital content.
- Assess the contributions of various providers to student achievement, and close virtual schools and programs that do not contribute to student growth.
- Implement a nationwide longitudinal study across multiple providers and with interim data checkpoints to assess the quality of the learning experience from the student perspective.
- Delineate the definitions of adequate quantity of instruction to ensure subject mastery.

Ensuring High-Quality Teachers

As in any K–12 educational setting, high-quality teachers are fundamental to student learning. But what constitutes quality teaching in a virtual setting and how that differs from brick-and-mortar schools are open questions. Recent evidence suggests that virtual schools' marketing materials often portray high-quality educational experiences and educators in

recruiting students.[55] Some virtual schools have adopted strategies aimed at using technology to expand student access to high-quality instructors. For example, the New York charter school network Success Academy developed virtual classrooms organized around particular teachers' strengths: "The best lecturer in a grade level or subject would deliver online lessons to a large group of students, while other teachers . . . worked one-on-one with students who needed help."[56] However, strategies like this one that focus solely on specific content delivery methods fail to recognize teaching as a holistic activity that includes a range of interpersonal interactions between teachers and students. To the extent that quality teaching is dependent on teacher-student relationships, narrowing the teacher role in virtual schools to simply delivering content is concerning and runs counter to established definitions of what constitutes teacher quality.

We continue to have limited evidence on how to identify quality teachers in virtual contexts, how to recruit and retain them, how to evaluate their effectiveness, and how to provide ongoing support to them to promote best practices. In all these areas, practice continues to outpace the available empirical evidence. Several recent reports provide frameworks that define elements of quality virtual teaching.[57] While existing research on virtual education focuses more on quality *teaching* than on quality *teachers*, the expectation of high-quality teaching has clear implications for the knowledge, skills, and abilities of quality virtual teachers. Three themes regarding teacher quality in virtual schools are worth noting: differentiated instruction, student-teacher relationships and peer engagement, and teacher professional development and planning time.[58]

First, research on quality virtual teaching emphasizes the potential of virtual schools to provide diverse and differentiated instruction that requires teachers to monitor learner progress and provide a variety of supports, to communicate with school staff about special accommodations for students, and to use quantitative and qualitative indicators to identify learners who need extra support.[59] However, a recent study of virtual teachers' "differentiation practices"—that is, their practices of making decisions that are responsive to the varying needs of students—found that virtual teachers, particularly new virtual teachers, often struggle to differentiate curricula and teaching strategies, and rarely use assessments to inform their instruction.[60] Further, differentiated instruction and other best practices may be undermined by the business model of larger for-profit virtual schools that hinges on creating economies of scale with lower-wage teachers all delivering standard content.

A second theme in the literature on high-quality virtual school teachers emphasizes their ability to engage with their students and build community by leveraging technologies to facilitate collaboration among learners, develop community among diverse learners, and meet the needs of all learners regardless of their background or ability.[61] However, one recent study found that virtual teachers provide limited student-student and teacher-student interactions and that fewer interactions were generally associated with lower math achievement, credits earned, and GPA.[62] And a Government Accountability Office (GAO) report released in January 2022 found that virtual charter schools "often rely on parents to act as instructors."[63] Research has indicated that virtual charter school instruction is mainly asynchronous and has limited student engagement, limited teacher contact time, and high student-teacher ratios.[64] As noted in Section I of this report (See Table 5), the student-teacher ratio in virtual charter schools across the U.S. was approximately 65% higher than for brick-

and-mortar public schools in the 2021-22 school year; the virtual ratio was 24.4:1 while the brick-and-mortar school ratio was 14.8:1.

A third theme related to quality virtual school teachers is their preparation and ongoing professional development. Similar to research on brick-and-mortar school teachers, recent reports and studies on virtual schools emphasize the importance of teachers meeting professional standards, holding appropriate credentials in the field in which they teach, and engaging in their work as "reflective practitioners."[65] The research also highlights the need for virtual school teachers to continue to pursue knowledge and skills regarding online teaching.[66]

As previous versions of this report have indicated, there remains little empirical research about quality virtual teachers. This subsection of the report examines developments and evidence from media outlets, policy reports, and empirical research regarding teacher recruitment, training, evaluation, and retention in virtual schools. This subsection also reviews 2021 and 2022 legislative activity in each area.

Consistent with our previous reports, our analysis of 2021 and 2022 legislative activity on virtual teacher recruitment, training, evaluation, and retention reveals similar trends. First, legislative activity related to teacher recruitment and training remains modest—only 6 states considered bills directly addressing these issues, and only 4 of the 12 proposed bills were successful. Two successful bills hold virtual teachers to similar certification standards as brick-and-mortar teachers, and the other two focus on professional development for virtual school teachers. Second, we found an increase in legislative activity with respect to factors that may increase virtual teacher satisfaction, retention, and success. While proposed legislation to control class size in virtual schools was not successful, five bills addressing student attendance and engagement were enacted by state legislatures.

Recruiting and Training Qualified Teachers

A number of virtual teaching organizations across the country assert that they have not faced the same shortages of teachers that brick-and-mortar schools are experiencing. One recent news article reported that virtual schools have been "inundated with applications'" and are "attracting more candidates than they can hire" while "many brick-and-mortar districts seek to fill vacancies."[67] For example, Lowcountry Connections Academy, a virtual school in South Carolina, reported receiving more than a thousand applications for four new teacher openings.[68] Likewise, Virtual Arkansas has not forecasted a pending shortage of online teachers. On the contrary, a spokesperson indicated a dramatic increase in prospective teachers interested in job opportunities: "In our program, we routinely see several dozen applicants for each position we post which gives us an opportunity to hire very highly qualified educators."[69] By these accounts, many teachers may be choosing the online context, particularly given their training and experience during the pandemic and the flexibility that remote teaching allows. However, as described below, dissatisfaction with large class sizes, heavy workload, low pay, and limited student engagement may result in retention issues in virtual schools.

The Michigan Virtual Learning Research Institute surveyed representatives of the Virtual Learning Leadership Alliance's member organizations and identified several challenges to recruiting teachers to online learning programs, including positions that are only part-time, non-competitive compensation packages and retirement plans, and specialized teaching areas that are difficult to fill. Survey respondents also indicated that perceptions that online teaching is less rigorous than face-to-face teaching were a barrier to recruitment. In response to these challenges, the report offered several recommendations for recruitment, including providing permanent, full-time positions for online teachers and exploring compensation packages—including retirement planning—that are more comparable to those offered to in-person teachers.[70] However, these recommendations may be difficult to reconcile with the business model of for-profit virtual schools.

Empirical evidence on how best to prepare and train virtual school teachers continues to be limited. In addition to uneven state requirements related to certification and licensure, many virtual schools prepare teachers through orientation programs that provide information and instruction about "online teaching in general as well as instruction on the specific learning management system (LMS), state requirements, instructional approach and expectations, policies, and procedures of the virtual program."[71] Many programs assign new online teachers a mentor, who is an experienced online teacher, to provide additional support in their first semester or year of online teaching. Yet, the dramatic increase in teachers being hired in the past two years has created a great deal of stress on the orientation processes in many virtual schools.[72]

Another report from the Michigan Virtual Learning Research Institute, which included survey data from more than 1,800 virtual educators representing 17 schools or learning programs, provided information on the strategies that virtual school administrators employ to support teachers.[73] Interestingly, teachers who responded to the survey rated their undergraduate coursework—including but not limited to coursework in education—as the least common source of professional learning to develop virtual teaching skills, which is consistent with calls for university-based teacher preparation programs to change with the evolving modalities of teaching[74] by providing opportunities for prospective teachers to gain experience teaching in both virtual and face-to-face settings.[75]

While the most common source of professional learning for virtual teachers was the mandatory training provided by their schools, teachers also reported learning through peer mentoring, attending conferences, and participating in courses or webinars provided by educational organizations. Virtual teachers also indicated that their administrators supported them by providing opportunities for professional development, observing and offering feedback on their teaching, providing time in their schedule for planning and development, and communicating clear expectations for them and their work. Despite these supports, virtual teachers identified challenges that they face, which included motivating and engaging students in an online setting, dealing with technological challenges (e.g., internet outages, mastering new learning management systems), and managing work-life balance.[76]

Research has identified a number of training areas that are needed to better support the work of virtual teachers, such as engaging virtual learners, differentiating instruction to meet the needs of all students, and equitably supporting diverse groups of students, includ-

ing special education students, English Language Learners (ELLs), and students of color.[77] A report from Montgomery Public Schools' Office of Legislative Oversight notes:

> While virtual education can cut across geographical boundaries and allow students to access courses they otherwise would not be able to, virtual education can magnify inequities in resources, such as access to a dedicated space to do schoolwork, access to caregivers who can provide guidance during virtual learning sessions, and a strong connection to the internet and appropriate devices.[78]

However, virtual schools have historically enrolled fewer students from racial and ethnic minority groups, fewer ELLs, and fewer low-income students than other schools.[79] Furthermore, a recent study suggests that virtual teachers often bring bias into virtual classrooms.[80] This is an important area for professional development, because teachers could "play a key role in mitigating the inequity in online education."[81] While teacher training may help address inequities in virtual school instruction, the proportionally lower enrollment rates of ELLs and low-income students in virtual schools is a much broader issue that likely involves the high parental demands of virtual education and the motives of for-profit companies to minimize costs.

Our analysis of 2021 and 2022 legislation on virtual schools identified a number of bills related to virtual teacher recruitment and training. Seven of these bills, including only two that passed, focused on teacher certification and licensure requirements. An enacted 2022 Michigan bill (MI SB 845) requires teachers of record in virtual schools to be certified for the grade level or to be "working under a valid substitute permit, authorization, or approval issued by the department." An enacted North Carolina bill (NC HB 103, 2022) requires virtual school employees to meet the same licensure requirements required for in-person employees of the local district. A 2022 Texas bill (TX HB 681) that was pending at the time of this analysis would allow teacher candidates to satisfy certification requirements through internships that allow them to teach courses through local remote learning programs or state virtual schools. A failed Florida bill (FL SB 980, 2022) would have removed a requirement that all instructional staff in Florida virtual instruction programs be Florida-certified teachers. A Maryland bill that failed (MD HB 1163, 2022) would have required virtual schools to develop plans for staff recruitment and would have required virtual school teachers and staff to meet similar certification requirements to all other public school teachers.

We identified five additional bills related to virtual teacher professional development. Several of these bills included requirements for teacher training on virtual instruction; only one passed. A bill that was enacted in Texas in 2021 (TX SB 15) stipulated that teachers could not teach a virtual course in a full-time virtual learning program unless they had completed a professional development course on virtual instruction; the bill further specifies that districts cannot require teachers to provide hybrid instruction or coerce teachers to teach in a full-time virtual learning program. An unsuccessful 2021 bill in Alaska (AK SB 42) aimed to require training on virtual instruction methods and differences between virtual and classroom-based instruction for teachers of students in grades 6 through 12. Two contrasting 2022 bills in Maryland failed—one (MD HB 1163) would have required virtual instruction training in teacher preparation programs as well as ongoing training and professional development, while the other (MD HB 805) would have exempted virtual schools from several

state policies, including those related to professional development. A bill enacted in Michigan in 2021 (MI HB 4411) stipulated that the Michigan Virtual University would operate the Michigan Virtual Learning Research Institute, which they charged with supporting and accelerating "innovation in education" and providing leadership for Michigan's system of virtual learning education.

Evaluating and Retaining Effective Teachers

The evaluation of virtual school teachers continues to be an issue needing greater research and policy attention. As documented in our previous reports, conventional teacher evaluation systems do not translate well to virtual settings because of factors like asynchronous instruction, limited face-to-face time, and student self-pacing. Existing research indicates that teacher evaluation occurs in virtual schools—mostly through master teacher and administrator observation—but offers little guidance on best practices for evaluating and supporting virtual school teachers.[82]

Retaining high-quality teachers in virtual schools is also an important consideration. Teachers who are more satisfied with their work are more likely to remain in their jobs. As a result, in past reports, much of our attention focused on factors that research identified related to teacher satisfaction in virtual schools. Research has identified a number of factors related to virtual school teacher satisfaction, including schedule flexibility, time to engage with individual students, class size, workload, and conditions required for teachers to positively affect student performance.[83] Given these findings, it is not surprising that studies have identified student attendance, perseverance, and engagement as concerns in teacher satisfaction and retention.[84] Research has also identified compensation and professional development opportunities focused on "teacher growth and leadership" as important.[85]

Compensation is also a relevant factor in teacher retention. The majority of virtual teachers are part-time and their compensation is based on student enrollment, generally ranging from $130 to over $200 per student per class, depending on experience and type of course. Full-time virtual teacher compensation is typically structured like the pay scales of brick-and-mortar schools in their state.[86]

A recent study examined levels of job satisfaction and turnover intention of teachers in online schools. Using data from the 2015-2016 National Teacher and Principal Survey, including an adjusted sample of 28,150 teachers in 5,440 schools, the authors found that, relative to teachers in regular brick-and-mortar schools, online teachers have higher levels of job satisfaction. More specifically, online teachers report satisfaction levels about one-fifth of a standard deviation higher than teachers in brick-and-mortar schools. In the authors' words, "Working within OS [online schools] appears to offer teachers, overall, greater benefits than experienced by those teachers working in TPS [brick-and-mortar public schools]," yet, online teachers do not significantly differ from other teachers in their intent to leave teaching or move to a different school.[87] However, since teachers sort themselves into virtual and brick-and-mortar schools based on their own preferences, these findings do not necessarily suggest that teachers in brick-and-mortar schools would be more satisfied if they taught

online.

Our analysis of 2021 and 2022 legislation on virtual schools identified just a handful of bills related to the evaluation of virtual teachers and a number of bills with the potential to impact teacher retention indirectly through factors related to teacher satisfaction, but many of these bills failed.

Three bills (two that were successful) included requirements that virtual schools evaluate their staff. A bill enacted in Michigan in 2021 (MI HB 4411) required the development of virtual teacher evaluation systems and criteria by which virtual school and course providers would be evaluated to ensure "quality education." A 2022 North Carolina bill (NC HB 103) that passed requires virtual school employees to meet the same evaluation requirements required for in-person employees of the local district. A 2022 Maryland bill (MD HB 1163) that failed would have required virtual schools to develop plans for staff evaluation.

Similar to our 2019 and 2020 legislative analysis, our examination of 2021 and 2022 legislative activity revealed a number of bills addressing factors related to virtual teacher satisfaction that may affect retention. Ten bills focused on creating new requirements related to student attendance. These include two that passed (TX SB 15, 2021; MO HB 1552, 2022), seven that failed (MD HB 805, 2022; MD HB 848, 2022; PA HB 154, 2021; TX SB 27, 2021; TX SB 3265, 2021; TX SB 1389, 2021; OK HB 3645, 2022), and one pending (MI SB 664, 2021).

Another set of bills, including three that passed, focused on student engagement in virtual schooling environments. A successful 2021 Vermont bill (VT HB 439) appropriated funds to address factors related to remote learning, including supporting student engagement. A 2022 Michigan bill (MI SB 845) that passed created a participation requirement for students enrolled in virtual schools. A successful 2022 Missouri bill (MO HB 1552) gave virtual schools the responsibility to monitor individual students' success and engagement in the learning program. A 2021 North Carolina bill (NC HB 644) that was pending at the time this report was written would require school boards seeking to offer virtual schooling options to submit a plan to the State Board of Education specifying the minimum amount of time each student must spend in synchronous instruction with a licensed teacher to complete a course. A 2021 Texas bill (TX SB 27), which failed, would have required virtual learning programs to develop and adopt engagement policies that outlined factors including students' academic and behavioral expectations and intervention strategies.

Three bills focused on class size in virtual schools all failed. A 2021 Tennessee bill that failed (TN SB 703) would have allowed virtual schools to increase their maximum class sizes by up to 30%. A 2022 Maryland bill (MD HB 805) that failed would have exempted virtual schools from state policies related to class size. A 2022 Arizona bill (AZ HB 2426) would have commissioned a study of several aspects of online instruction in Arizona, including average class sizes.

COVID-19

The COVID-19 pandemic has had a profound impact on K–12 education, and teachers in

particular. The pandemic abruptly forced many classroom teachers into a new paradigm of remote teaching. Exposure to and experience with new instructional technologies has created more options for some teachers who prefer greater flexibility, more part-time opportunities, and in some cases, a more limited scope of responsibilities focused on content delivery. While this is attractive to some educators, this narrowing of the teacher role is concerning, given what we know about high-quality teaching and the importance of teacher-student interactions.

A recent study suggests that parents perceived that virtual schools offered higher-quality teaching and learning to their children during the pandemic than brick-and-mortar schools that were forced to move online temporarily. Specifically, the survey results of parents with children in these different schools indicate that "virtual schools dramatically outperformed brick-and-mortar schools when it comes to promoting active learning, communicating effectively, managing a classroom, and providing high-quality instruction."[88] These parent perceptions are not surprising: While virtual schools had systems in place for online teaching, learning, and communications, the onset of the pandemic caught most brick-and-mortar schools unprepared to pivot overnight to fully remote activities and resulted in an abrupt transition for teachers, parents, and students.

Although most students and teachers have returned to brick-and-mortar schools following the pandemic, many school districts organized mainly around brick-and-mortar settings are opening their own full-time virtual schools.[89] A recent report suggests that 73% of districts nationwide plan to expand virtual learning opportunities for students.[90] The extent to which these districts engage in evidence-based recruitment, training, evaluation, and retention practices for their online teachers is unclear; legislation to ensure that their virtual schools are staffed with high-quality educators is essential.

A range of approaches to staffing virtual schooling is being adopted across the country. Some districts allow their current teachers to teach in virtual schools, others create separate teaching and administrative staff for those schools, and others outsource virtual teaching to outside companies.[91] Districts also vary in terms of requirements specific to virtual teaching, although many are identifying teachers "who have thrived and love connecting with students through the technology platform."[92]

In the wake of the pandemic, only a few bills introduced in 2021 or 2022 directly related to the COVID-19 pandemic. A bill enacted in North Carolina in 2021 (NC SB 105) granted bonuses of $1,000 to public school teachers and instructional support personnel who participated in professional development related to mitigating COVID-19 in public schools, learning loss stemming from the COVID-19 pandemic, or virtual instruction as a result of the COVID-19 pandemic. A 2022 Maryland bill (MD HB 1163) that failed would have required mental health support to be provided to school personnel during prolonged school closure periods that led to a transition to virtual instruction.

Recommendations to Ensure Teacher Quality

High-quality teachers are an essential ingredient of effective K–12 education regardless

of instructional modality. However, more research is needed on the knowledge and skills teachers need to be effective in virtual settings, the supply and demand for online teachers, and the factors related to retaining quality virtual teachers. We agree with calls "to establish a national research agenda to study what works for whom in virtual settings" to guide educators, policymakers, and school system leaders in designing effective online learning options that yield better academic and social-emotional outcomes. "Without more research, policy decisions may be driven by personal or financial interest—or hunches—instead of data or best practices."[93] This is particularly true for policy on the preparation, professional development, evaluation, and retention of quality virtual teachers. Further, our legislative analysis demonstrates that little progress has been made over the past two years on issues related to teacher quality in virtual contexts. A handful of state legislatures introduced bills related to the certification and ongoing professional development of virtual teachers, and several considered, and in some cases enacted, new laws that may increase the satisfaction and retention of virtual teachers.

Given these findings, we reiterate several recommendations from previous reports. Specifically, we recommend that policymakers, educational leaders, and researchers work together to:

- Define certification training and relevant teacher licensure requirements specific to teaching responsibilities in virtual schools, and require research-based professional development to promote effective and equitable online teaching.
- Address retention issues by developing guidelines for appropriate student-teacher ratios and attending to other working conditions (for example, student attendance and engagement) that may affect teachers' decisions about where to work.
- Work with emerging research to develop valid and comprehensive teacher evaluation rubrics and accountability systems specific to online teaching that reflect important elements of virtual teaching like differentiated instruction, student engagement, and equitable support of all learners.
- Identify and maintain data on teachers and instructional staff that will allow education leaders and policymakers to monitor staffing patterns and assess the quality and professional development needs of teachers in virtual schools.
- Examine the work and responsibilities of virtual school administrators and ensure that those hired for these roles are prepared with the knowledge and skills to be effective, particularly with respect to evaluating and supporting teachers and promoting best practices.

Notes and References Section III

1 In our previous reports we reported that fewer than 26% of bills proposed in 2019 and 2020 were enacted, and fewer than 40% of bills proposed in 2017 and 2018 were enacted.

2 The keyword *blended learning* was added to the 2015 and 2016 legislative bill analysis, and was not used in previous searches of the StateNet® Bill Tracking Database. The authors thank Ben Erwin (Policy Researcher, Education Commission of the States) and the Education Commission of the States for their assistance in developing the database of virtual school-related bills for the 2021 and 2022 legislative sessions.

3 In 2020, 59 bills were considered in 23 states: nine were enacted, 42 failed, and eight were pending. In 2019, 58 bills were proposed in 23 states: 17 were enacted, and 41 failed. In 2018, 42 bills were considered in 23 states; 17 were enacted, 19 failed and six were pending. In 2017, 86 bills were considered in 34 states; 28 were enacted, 54 failed and 4 were pending. In 2016, 113 bills were considered in 37 states; 33 were enacted, 60 failed and 20 were pending. In 2015, 98 bills were considered in 28 states; 36 were enacted and 62 failed. In 2014, 131 bills were considered in 36 states; 38 were enacted, 62 failed, and 31 were pending. In 2013, 128 bills were considered in 25 states; 29 were enacted, 7 failed and 92 were pending. In 2012, 128 bills were considered in 31 states; 41 were enacted and 87 failed.

4 In the 2017 and 2018 legislative sessions a total of 16 bills related to cybersecurity and student data privacy were proposed (eight bills were enacted, seven bills failed, and one was pending). In the 2019 and 2020 legislative sessions we identified only one bill related to cybersecurity and student data privacy: OH HB 684. In the 2021 and 2022 legislative sessions we identified only one bill related to cybersecurity and student data privacy in North Carolina (NC HB 196).

5 As in previous reports, we again highlight the work of Baker and Bathon (2013), who developed a comprehensive methodology for estimating the actual costs of virtual schools. This research eclipses the limited recommendations made by other recent reports that have attempted to define a process for costing-out virtual schooling. Specifically, Baker and Bathon outline how costs in virtual schools vary widely compared to those in brick-and-mortar schools. For example, virtual schools have lower costs associated with teacher salaries and benefits, facilities and maintenance, transportation, food service, and other in-person services than their brick-and-mortar counterparts. However, virtual schools may have higher costs linked to acquiring, developing, and providing the digital instruction and materials necessary for full-time virtual instruction; they also need to acquire and maintain necessary technological infrastructure. See Baker, B.D. & Bathon, J. (2012). *Financing online education and virtual schooling: A guide for policymakers and advocates*. Boulder, CO: National Education Policy Center. Retrieved November 12, 2013, from http://nepc.colorado.edu/publication/financing-online-education

6 National Alliance for Public Charter Schools (2016, June). *A call to action to improve the quality of full-time virtual charter public schools*. Washington, DC.: National Alliance for Public Charter Schools. Retrieved December 2, 2018, from https://www.publiccharters.org/sites/default/files/migrated/wp-content/uploads/2016/06/Virtuals-FINAL-06202016-1.pdf

7 Hanna, Maddie (2020, February 4). Wolf pushing charter-school bill that would change funding, accountability rules. *The Philadelphia Inquirer*. Retrieved January 22, 2021, from https://www.inquirer.com/news/charter-school-reform-pennsylvania-tom-wolf-budget-20200203.html

8 In January 2020, the Auditor General declared that "The General Assembly should revisit Pennsylvania's charter school law—which I believe is the worst in the nation—to make sure our limited education funding is not being diverted to benefit private companies." His investigation into Lincoln Learning Solutions' two charter schools uncovered several questionable accounting practices, including: a 148% pay raise for the CFO between 2014 and 2018; over $622,000 in expenses for lobbying the state legislature during the same years;

and an unusually high reserve fund of $81.8 million.

See: Trombola, N. (2020, July 22). Auditor General calls for change to state's charter school law after review of PA Cyber, Lincoln Park. *Pittsburgh Post-Gazette*. Retrieved January 20, 2021, from https://www.post-gazette.com/news/education/2020/07/22/Lincoln-Learning-Solutions-Pennsylvania-Cyber-Charter-school-Lincoln-Park-Performing-Arts-audit-law-DePasquale/stories/202007220118

DePasquale, E.A. (2020, July 22). *Lincoln Learning Solutions' $81.8 million reserve points to further need for charter school law reforms*. Harrisburg, PA: Bureau of School Audits, Pennsylvania. Retrieved December 30, 2020, from https://www.paauditor.gov/press-releases/auditor-general-depasquale-lincoln-learning-solutions-81-8-million-reserve-points-to-further-need-for-charter-school-law-reforms

9 In 2019, two moratorium bills were introduced in Pennsylvania. One bill calling for a moratorium on the "formation and approval of new cyber charter schools and the expansion of existing cyber charters" was proposed to allow the Legislative Budget and Finance Committee time to conduct its study and disseminate results (PA HB 1449). Another bill (PA HB 1897) called for the extreme measure of closing all virtual charters by the end of the 2020-21 academic year and suspending new applications for them. The bill also proposed allowing only districts to operate full-time cyber programs and restricting outside contracting for necessary support services to nonprofit entities.

10 Pennsylvania Department of the Auditor General. (2022, March 23). *Auditor General DeFoor announces responsibility for school audits will return to state Department of Education* [press release]. Retrieved February 1, 2023, from https://www.paauditor.gov/Media/Default/Print/RLS_DeFoor_SchoolAudits_032322_FINAL%20(002).pdf

11 Murphy, J. (2022, May 4). Auditor general's closure of school audit bureau draws criticism during Pa. House hearing. *Penn Live-Patriot News*. Retrieved February 2, 2023, from https://www.pennlive.com/news/2022/05/pa-house-democrats-criticize-auditor-generals-closure-of-school-audit-bureau.html

12 Children First PA Charter Performance Center. (2022, June). *Pennsylvania cyber charters are stockpiling funds that should be spent on students or returned to taxpayers*. Philadelphia, PA. Retrieved February 2, 2023, from https://www.childrenfirstpa.org/wp-content/uploads/2022/06/6-2022-Cyber-surplus-report.pdf

13 Arizona (AZ HB 2426), 2022.

14 Kansas (KS HB 2134), 2021.

15 Texas (TX SB 15), 2021.

16 Mississippi (MS HB 781), 2022; New Jersey (NJ S 2320), 2022; West Virginia (WV HB 2576), 2022; Maryland (MD HB 848, 2022; Vermont (VT H 468), 2022; Alaska (AK SB 42), 2021; Ohio (OH HB 110), 2021. Only the bill in Ohio passed.

17 As of December 16, 2020, K12 Inc., became Stride, Inc. See https://www.k12.com/about-k12.html

18 Stride, Inc. (2021). *Stride annual report 2021*. Herndon, VA. Retrieved April 18, 2023, from https://s26.q4cdn.com/126400783/files/doc_financials/2021/ar/STRIDE_AnnualReport_2021-Digital_Opt.pdf

19 Stride, Inc. (2022). *Stride annual report 2022*. Herndon, VA. Retrieved April 18, 2023, from https://s26.q4cdn.com/126400783/files/doc_financials/2021/ar/44624-D-01-STRIDE_AnnualReport_2022_Optimized[66].pdf

20 Business Wire. (2020, August 11). *K12 Inc. reports full year fiscal 2020 with revenues of $1.04 billion*. Herndon, VA. Retrieved on March 30, 2021, from https://www.businesswire.com/news/home/20200811005705/en/K12-Inc.-Reports-Full-Year-Fiscal-2020-with-Revenues-of-1.04-Billion

21 Molnar, A. (Ed.), Miron, G.C., Shank, C., Davidson, C., Barbour, M.K., Huerta, L., Shafter, S.R., & Rice, J.K.

(2019). *Virtual schools in the U.S. 2019*. Boulder, CO: National Education Policy Center. Retrieved June 1, 2019, from http://nepc.colorado.edu/publication/virtual-schools-annual-2019

22 Reed Ward, P. (2018, July 24). Cyber charter founder Trombetta is sentenced to 20 months in prison. *Pittsburgh Post-Gazette*. Retrieved November 15, 2018, from https://www.post-gazette.com/news/crime-courts/2018/07/24/Cyber-Charter-founder-Trombetta-sentenced-20-months-prison-8-million-midland-beaver-county/stories/201807240110#

23 In 2017, California enacted CA S406, a bill that restricts for-profit companies who petition for a charter after July 1, 2019, from operating or managing any new charter school.

24 In 2018, a bill was enacted in Ohio (OH S216) that ordered the superintendent of public instruction to address the process by which to determine full-time equivalency for student enrollment, define student attendance, and define engagement in e-schools, including: documentation of online learning; idle time; educational and non-educational; participation; classroom.

25 Michigan (MI SB 845) 2022.

26 Pennsylvania (PA SB 1), 2022.

27 Pennsylvania (PA SB 1), 2022.

28 Pennsylvania (PA SB 1), 2022.

29 New Jersey (NJ S 2320), 2022; Illinois (IL HB 3456), 2021; Hawaii (HI HR 73-201), 2021; Maine (ME HP 310), 2021; Michigan (MI SB 664), 2021.

30 North Carolina (NC SB 105), 2021; North Carolina (NC HB 196), 2021; Nevada (NV SB 173), 2021; Texas (TX HB 140), 2021; Vermont (VT HB 439), 2021; Rhode Island (RI HB 5834), 2021; West Virginia (WV HB 4699), 2022; California (CA AB 182), 2022.

31 Saavedra, A., Rapaport, A., & Silver, D. (2021, June 8). *Why some parents are sticking with remote learning—even as schools reopen*. Brookings Institution, Brown Center Chalkboard. Retrieved March 23, 2023, from https://www.brookings.edu/blog/brown-center-chalkboard/2021/06/08/why-some-parents-are-sticking-with-remote-learning-even-as-schools-reopen/

32 Stein, P. (2022, February 19). Enrollment in virtual schools is exploding. Will students stay long term? *The Washington Post*. Retrieved March 23, 2023, from https://www.washingtonpost.com/education/2022/02/19/virtual-school-enrollment-increase/

33 Singer, N. (2021, April 14). Online schools are here to stay, even after the pandemic. *The New York Times*. Retrieved January 21, 2023, from https://www.nytimes.com/2021/04/11/technology/remote-learning-online-school.html

34 Kuhfeld, M., Soland, J., & Lewis, K. (2022). *Test score patterns across three COVID-19-impacted school years*. (EdWorkingPaper: 22-521). Providence, RI: Annenberg Institute at Brown University. Retrieved March 23, 2023, from https://doi.org/10.26300/ga82-6v47

35 Blazer, C. (2009). *Literature review: Virtual schools*. Miami, FL: Miami-Dade County Public Schools, Office of Assessment, Research, and Data Analysis. Retrieved March 23, 2023, from https://files.eric.ed.gov/fulltext/ED536253.pdf

36 United States Government Accountability Office. (2022, January). *Department of Education should help states address student testing issues and financial risks associated with virtual schools, particularly virtual charter schools* [report to congressional requesters]. Washington, DC. Retrieved March 23, 2023, from https://www.gao.gov/assets/gao-22-104444.pdf

37 Blazer, C. (2009). *Literature review: Virtual schools*. Miami, FL: Miami-Dade County Public Schools, Office

of Assessment, Research, and Data Analysis. Retrieved March 23, 2023, from https://files.eric.ed.gov/fulltext/ED536253.pdf

38 QM Quality Matters, Virtual Learning Leadership Alliance, & Digital Learning Collaborative. (2022). *National standards for quality online learning*. Annapolis, MD. Retrieved March 23, 2023, from https://www.nsqol.org/

39 QM Quality Matters, Virtual Learning Leadership Alliance, & Digital Learning Collaborative. (2022). *Quality online programs, standard J: Instruction*. Annapolis, MD. Retrieved March 23, 2023, from https://www.nsqol.org/the-standards/quality-online-programs/

40 QM Quality Matters, Virtual Learning Leadership Alliance, & Digital Learning Collaborative. (2022). *Quality online programs, standard I: Curriculum and course design*. Annapolis, MD. Retrieved March 23, 2023, from https://www.nsqol.org/the-standards/quality-online-programs/

41 United States Government Accountability Office. (2022). *Department of Education should help states address student testing issues and financial risks associated with virtual schools, particularly virtual charter schools* [report to congressional requesters]. Washington, DC. Retrieved March 23, 2023, from https://www.gao.gov/assets/gao-22-104444.pdf

42 United States Government Accountability Office (2022). *Department of Education should help states address student testing issues and financial risks associated with virtual schools, particularly virtual charter schools* [report to congressional requesters]. Washington, DC. Retrieved March 23, 2023, from https://www.gao.gov/assets/gao-22-104444.pdf

43 Jensen, J., Smith, C.M., Bowers, R., Kaloi, M., Ogden, T.H., Parry, K.A., Payne, J.S., Fife, P., & Holt, E. (2022). Asynchronous online instruction leads to learning gaps when compared to a flipped classroom. *Journal of Science Education and Technology, 31,* 718-729. Retrieved January 30, 2023, from https://doi.org/10.1007/s10956-022-09988-7

44 Edmentum. (n.d.) *Virtual learning and rural schools: Improving access and opportunity for learners in rural communities*. Bloomington, MN. Retrieved March 23, 2023, from https://www.edmentum.com/sites/edmentum.com/files/resource/media/Virtual%20Learning%20and%20Rural%20Schools%20-%20Improving%20Access%20and%20Opportunity%20for%20Learners%20in%20Rural%20Communities.pdf

45 Rural Virtual Academy. (2022). *Annual report, 2021-2022*. Medford, WI. Retrieved March 23, 2023, from https://static1.squarespace.com/static/58a496a1e4fcb5138a2baa51/t/62b33e74fad9897d20327d3b/1655914115461/RVA+Annual+Report+21-22+Final.pdf

46 Center on Reinventing Public Education. (2015). *The policy framework for online charter schools* (p. 9). Retrieved January 6, 2016, from http://www.crpe.org/sites/default/files/crpe-policy-framework-onlinecharter-schools-final_0.pdf

47 QM Quality Matters, Virtual Learning Leadership Alliance, & Digital Learning Collaborative. (2022). *Quality online programs, standard K: Assessment and learner performance*. Annapolis, MD. Retrieved March 23, 2023, from https://www.nsqol.org/the-standards/quality-online-programs/

48 Fleetwood, A. & Parker A. (2022). *FLVS full time reduces achievement gap*. Orlando, FL: Florida Virtual School. Retrieved March 23, 2023, from https://www.flvs.net/docs/default-source/research/flvs-full-time-reduces-achievement-gap.pdf

49 Virtual Public Schools Act Evaluation Criteria. Tennessee Code § 49-16-213 (2021). Retrieved March 23, 2023, from https://law.justia.com/codes/tennessee/2021/title-49/chapter-16/part-2/section-49-16-213/

50 Bowser, M. (2022, August). *Virtual school monitoring framework overview*. Nashville, TN: Tennessee Department of Education. Retrieved March 23, 2023, from https://www.tn.gov/content/dam/tn/education/

nonpublic/Virtual_School_Monitoring_Training.pdf

51 Barbour, M.K., LaBonte, R., Kelly, K., Hodges, C., Moore, S., Lockee, B., Trust, T., Bond, A., & Hill, P. (2020). *Understanding pandemic pedagogy: Differences between emergency remote, remote, and online teaching*. Halfmoon Bay, BC, Canada: State of the Nation: K-12 E-Learning in Canada. Retrieved March 23, 2023, from https://k12sotn.ca/wp-content/uploads/2020/12/understanding-pandemic-pedagogy.pdf

52 Barbour, M.K., LaBonte, R., Kelly, K., Hodges, C., Moore, S., Lockee, B., Trust, T., Bond, A., & Hill, P. (2020). *Understanding pandemic pedagogy: Differences between emergency remote, remote, and online teaching*. Halfmoon Bay, BC, Canada: *State of the nation: K-12 E-learning in Canada*. Retrieved March 23, 2023, from https://k12sotn.ca/wp-content/uploads/2020/12/understanding-pandemic-pedagogy.pdf

53 Johnson, C.C., Walton, J.B., Strickler, L., & Elliott, J.B. (2022). Online teaching in K–12 education in the United States: A systematic review. *Review of Educational Research*, *0*(0). Retrieved March 23, 2023, from https://doi.org/10.3102/00346543221105550

54 Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020, December 8). *COVID-19 and learning loss—Disparities grow and students need help*. New York, NY: McKinsey & Company. Retrieved March 23, 2023, from https://www.mckinsey.com/industries/public-and-social-sector/our-insights/covid-19-and-learning-loss-disparities-grow-and-students-need-help

55 Beck, D., French, S.D., Allred, J.B., & Goering, C.Z. (2022). What they are really saying: An analysis of the messages in full-time virtual school television-length advertisements. *Cogent Education, 9*(1), 1-16.

56 Pitts, C., Pillow, T., Dusseault, B., & Lake, R. (2022, January). *Virtual learning, now and beyond*. Seattle, WA: The Center on Reinventing Public Education (p. 13). Retrieved January 17, 2023, from https://crpe.org/wp-content/uploads/final2-Virtual-learning-post-COVID-report.pdf

57 Archambault, L., Leary, H., & Rice, K. (2022). Pillars of online pedagogy: A framework for teaching in online environments. *Educational Psychologist, 57*(3), 178-191.

QM Quality Matters, Virtual Learning Leadership Alliance, & Digital Learning Collaborative. (2019). *National standards for quality online teaching* (3rd ed.). Annapolis, MD. Retrieved January 21, 2023, from https://www.nsqol.org/wp-content/uploads/2019/02/National-Standards-for-Quality-Online-Teaching.pdf

58 Erwin, B. (2021). *A policymaker's guide to virtual schools.* Denver, CO: Education Commission of the States. Retrieved January 21, 2023, from https://www.ecs.org/wp-content/uploads/Policymakers-Guide-to-Virtual-Schools.pdf.

Gallagher, H.A. & Cottingham, B. (2020). *Improving the quality of distance and blended learning*. Providence, RI: Annenberg Institute at Brown University. Retrieved January 21, 2023, from https://annenberg.brown.edu/sites/default/files/EdResearch_for_Recovery_Brief_8.pdf

59 Erwin, B. (2021). *A policymaker's guide to virtual schools.* Denver, CO: Education Commission of the States. Retrieved January 21, 2023, from https://www.ecs.org/wp-content/uploads/Policymakers-Guide-to-Virtual-Schools.pdf

Gallagher, H.A. & Cottingham, B. (2020). *Improving the quality of distance and blended learning*. Providence, RI: Annenberg Institute at Brown University. Retrieved January 21, 2023, from https://annenberg.brown.edu/sites/default/files/EdResearch_for_Recovery_Brief_8.pdf

QM Quality Matters, Virtual Learning Leadership Alliance, & Digital Learning Collaborative. (2019). *National Standards for Quality Online Teaching* (3rd ed.). Annapolis, MD. Retrieved January 21, 2023, from https://www.nsqol.org/wp-content/uploads/2019/02/National-Standards-for-Quality-Online-Teaching.pdf

60 Beck, D. & Beasley, J. (2021). Identifying the differentiation practices of virtual school teachers. *Education and Information Technologies, 26*, 2191-2205.

61 QM Quality Matters, Virtual Learning Leadership Alliance, & Digital Learning Collaborative. (2019). *National standards for quality online teaching* (3rd ed., p. 16). Retrieved January 21, 2023, from https://www.nsqol.org/wp-content/uploads/2019/02/National-Standards-for-Quality-Online-Teaching.pdf

Cohen, L. & Popoff, E. (2022). *A human-centered vision for quality virtual learning* (p. 11). Bloomington, MN: Edmentum. Retrieved January 21, 2023, from https://www.edmentum.com/resources/human-centered-vision-for-quality-virtual-learning

62 Bradley-Dorsey, M., Beck, D., Maranto, R., Tran, B., Clark, T., & Liu, F. (2022). Is cyber like in-person? Relationships between student-student, student-teacher interaction and student achievement in cyber schools. *Computers and Education Open,* 1-12.

63 United States Government Accountability Office (2022). *Department of Education should help states address student testing issues and financial risks associated with virtual schools, particularly virtual charter schools* [report to congressional requesters], (preface, p. ii). Washington, DC. Retrieved January 21, 2023, from https://www.gao.gov/assets/gao-22-104444.pdf

64 Gill, B., Walsh, L., Wulsin, C.S., Matulewicz, H., Severn, V., Grau, E., Lee, A., & Kerwin, T. (2015). *Inside online charter schools*. Cambridge, MA: Mathematica Policy Research.

65 QM Quality Matters, Virtual Learning Leadership Alliance, & Digital Learning Collaborative. (2019). *National standards for quality online teaching* (3rd ed., p. 8). Annapolis, MD. Retrieved January 21, 2023, from https://www.nsqol.org/wp-content/uploads/2019/02/National-Standards-for-Quality-Online-Teaching.pdf

66 Erwin, B. (2021). *A policymaker's guide to virtual schools.* Denver, CO: Education Commission of the States. Retrieved January 21, 2023, from https://www.ecs.org/wp-content/uploads/Policymakers-Guide-to-Virtual-Schools.pdf

Gallagher, H.A. & Cottingham, B. (2020). *Improving the quality of distance and blended learning*. Providence, RI: Annenberg Institute at Brown University. Retrieved January 21, 2023, from https://annenberg.brown.edu/sites/default/files/EdResearch_for_Recovery_Brief_8.pdf

Pitts, C., Pillow, T., Dusseault, B., & Lake, R. (2022, January). *Virtual learning, now and beyond* (p. 11). Seattle, WA: The Center on Reinventing Public Education. Retrieved January 17, 2023, from https://crpe.org/wp-content/uploads/final2-Virtual-learning-post-COVID-report.pdf

67 Lehrer-Small, A. (2022, September 27). *"Inundated with applications": No teacher shortage at virtual schools*. The 74. Retrieved January 21, 2023, from https://www.the74million.org/article/inundated-with-applications-no-teacher-shortage-at-virtual-schools/

68 Lehrer-Small, A. (2022, September 27). *"Inundated with applications": No teacher shortage at virtual schools*. The 74. Retrieved January 21, 2023, from https://www.the74million.org/article/inundated-with-applications-no-teacher-shortage-at-virtual-schools/

69 Virtual Learning Leadership Alliance (2022, June). *Step to hire & keep the best online educators***.** *Palatka, Florida:* Virtual Learning Leadership Alliance. Retrieved January 21, 2023, from https://www.virtuallearningalliance.org/steps-to-hire-keep-the-best-online-educators/

70 Timke, E. & DeBruler, K. (2022). *Recruitment and retention of online teachers*. Lansing, MI: Michigan Virtual University. Retrieved January 21, 2023, from https://michiganvirtual.org/research/publications/online-teacher-recruitment-retention/

71 Timke, E. & DeBruler, K. (2022). *Recruitment and retention of online teachers*. Lansing, MI: Michigan Virtual University (p. 5). Retrieved January 21, 2023, from https://michiganvirtual.org/research/publications/online-teacher-recruitment-retention/

72 Timke, E. & DeBruler, K. (2022). *Recruitment and retention of online teachers*. Lansing, MI: Michigan Virtual

University. Retrieved January 21, 2023, from https://michiganvirtual.org/research/publications/online-teacher-recruitment-retention/

73 Harrington, C. & DeBruler, K. (2021). *Key strategies for supporting teachers in virtual learning environments*. Lansing, MI: Michigan Virtual University. Retrieved April 26, 2023, from https://michiganvirtual.org/research/publications/key-strategies-for-supporting-teachers/

74 Putnam, R.S. & Rose, C.D. (2023). Virtual practice for authentic classrooms: How to prepare preservice teachers to be day one ready. In A.S. Zimmerman (Ed.), *Research, practice, and innovations in teacher education during a virtual age* (137-157). Hershey, PA: Information Science Reference.

75 Ferlazzo, L. (2022, May 16). Make teacher prep practical, not theoretical. *Education Week*. Retrieved January 21, 2023, from https://www.edweek.org/teaching-learning/opinion-make-teacher-prep-practical-not-theoretical/2022/05

Herold, B. (2021, May 18). Remote learning is changing schools. Teacher-preparation programs have to adjust. *Education Week*. Retrieved January 21, 2023, from https://www.edweek.org/teaching-learning/remote-learning-is-changing-schools-teacher-preparation-programs-have-to-adjust/2021/05

76 Harrington, C. & DeBruler, K. (2021). *Key strategies for supporting teachers in virtual learning environments*. Lansing, MI: Michigan Virtual University. Retrieved May 3, 2023, from https://michiganvirtual.org/research/publications/key-strategies-for-supporting-teachers/

77 Martin, F. & Borup, J. (2022). Online learner engagement: Conceptual definitions, research themes, and supportive practices. *Educational Psychologist, 57*(3), 162-177.

Beck, D. & Beasley, J. (2021). Identifying the differentiation practices of virtual school teachers. *Education and Information Technologies, 26*, 2191-2205.

78 Simmons, K. (2022). *K-12 virtual education: Promising practices* (p. ii). Rockville, MD: Office of Legislative Oversight, Montgomery County, Maryland. Retrieved January 17, 2023, from https://www.montgomerycountymd.gov/OLO/Resources/Files/2022_reports/OLOReport2022_10.pdf

79 Simmons, K. (2022). *K-12 virtual education: Promising practices*. Rockville, MD: Office of Legislative Oversight, Montgomery County, Maryland. Retrieved January 17, 2023, from https://www.montgomerycountymd.gov/OLO/Resources/Files/2022_reports/OLOReport2022_10.pdf

80 Copur-Gencturk, Y., Thacker, I., & Cimpian, J.R. (2022). Teacher bias in the virtual classroom. *Computers & Education, 191*, 1-17.

81 Tate, T. & Warschauer, M. (2022). Equity in online learning (p. 202). *Educational Psychologist,* 57(3), 192-206.

82 Gill, B., Walsh, L., Wulsin, C.S., Matulewicz, H., Severn, V., Grau, E., Lee, A., & Kerwin, T. (2015). *Inside online charter schools*. Cambridge, MA: Mathematica Policy Research.

Kennedy, K. (2015). *Recruiting, training, supporting, and evaluating online teachers: A cross-case analysis of teaching infrastructure across virtual schools*. Lansing, MI: Michigan Virtual University. Retrieved January 21, 2023, from https://michiganvirtual.org/research/publications/recruiting-training-supporting-and-evaluating-online-teachers-a-cross-case-analysis-of-teaching-infrastructure-across-virtual-schools/

83 Borup, J. & Stevens, M.A. (2016). Factors influencing teacher satisfaction at an online charter school. *Journal of Online Learning Research*, *2*(1), 3–22.

Larkin, I.M., Brantley-Dias, L., & Lokey-Vega, A. (2016). Job satisfaction, organizational commitment, and turnover intention of online teachers in the K-12 setting. *Online Learning*, *20*(3), 25-51.

Timke, E., & DeBruler, K. (2022). *Recruitment and retention of online teachers*. Lansing, MI: Michigan

Virtual University. Retrieved January 21, 2023, from https://michiganvirtual.org/research/publications/online-teacher-recruitment-retention/

84 Zweig, J., Stafford, E., Clements, M., & Pazzaglia, A.M. (2015, November). *Professional experiences of online teachers in Wisconsin: Results from a survey about training and challenges*. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Midwest. Retrieved January 24, 2021, from https://ies.ed.gov/ncee/edlabs/projects/project.asp?projectID=1463

85 Timke, E. & DeBruler, K. (2022). *Recruitment and retention of online teachers* (p. 8). Lansing, MI: Michigan Virtual University. Retrieved January 21, 2023, from https://michiganvirtual.org/research/publications/online-teacher-recruitment-retention/

86 Digital Learning Collaborative. (2019). *Snapshot 2019: A review of K-12 online, blended, and digital learning*. Durango, CO. Retrieved January 23, 2021 from https://static1.squarespace.com/static/59381b9a17bffc68bf625df4/t/5cae3c05652dea4d690f5315/1554922508490/DLC-KP-Snapshot2019_040819.pdf

87 Roch, C.H. & Montague, C. (2021). Teaching in the virtual world: Examining teachers' job satisfaction and turnover (p. 2808). *Social Science Quarterly, 102*(6), 2795-2811.

88 Kingsbury, I. (2021). Online learning: How do brick and mortar schools stack up to virtual schools? (p. 6586). *Education and Information Technologies, 26*, 6567-6588.

89 Erwin, B. (2021). *A policymaker's guide to virtual schools*. Denver, CO: Education Commission of the States. Retrieved January 21, 2023, from https://www.ecs.org/wp-content/uploads/Policymakers-Guide-to-Virtual-Schools.pdf

Heubeck, E. (2021, April 30). New teaching jobs may emerge with continued demand for virtual learning. *Education Week*. Retrieved January 21, 2023, from https://www.edweek.org/teaching-learning/new-teaching-jobs-may-emerge-with-continued-demand-for-virtual-learning/2021/04

Kaufman, J.H. & Diliberti, M.K. (2021). Divergent and inequitable teaching and learning pathways during (and perhaps beyond) the pandemic: Key findings from the American Educator Panels spring 2021 COVID-19 surveys. Santa Monica, CA: RAND Corporation. Retrieved January 21, 2023, from https://www.rand.org/pubs/research_reports/RRA168-6.html

Klein, A. (2022, April 12). Virtual instruction is here to stay. Here are 7 tips for doing it well. *Education Week*. Retrieved January 21, 2023, from https://www.edweek.org/technology/virtual-instruction-is-here-to-stay-here-are-7-tips-for-doing-it-well/2022/04

Lake, R.J. (2021, October 25). The pandemic could have unlocked remote schooling. It hasn't. *Education Week*. Retrieved January 21, 2023, from https://www.edweek.org/leadership/opinion-the-pandemic-could-have-unlocked-remote-schooling-it-hasnt/2021/10

Simmons, K. (2022). *K-12 virtual education: Promising practices*. Rockville, MD: Office of Legislative Oversight, Montgomery County, Maryland. Retrieved January 17, 2023, from https://www.montgomerycountymd.gov/OLO/Resources/Files/2022_reports/OLOReport2022_10.pdf

90 Cohen, L. & Popoff, E. (2022). *A human-centered vision for quality virtual learning* (p. 11). Bloomington, MN: Edmentum. Retrieved January 21, 2023, from https://www.edmentum.com/resources/human-centered-vision-for-quality-virtual-learning

91 Gerwetz, C. (2021, May 4). Remote learning isn't going away. Will it create separate—and unequal—school systems? *Education Week*. Retrieved May 3, 2023, from https://www.edweek.org/leadership/remote-learning-isnt-going-away-will-it-create-separate-and-unequal-school-systems/2021/05

Simmons, K. (2022). *K-12 virtual education: Promising practices*. Rockville, MD: Office of Legislative Oversight, Montgomery County, Maryland. Retrieved January 17, 2023, from https://www.montgomerycountymd.gov/OLO/Resources/Files/2022_reports/OLOReport2022_10.pdf

92 Heubeck, E. (2021, April 30). New teaching jobs may emerge with continued demand for virtual learning. *Education Week*. Retrieved January 21, 2023, from https://www.edweek.org/teaching-learning/new-teaching-jobs-may-emerge-with-continued-demand-for-virtual-learning/2021/04

93 Pitts, C., Pillow, T., Dusseault, B., & Lake, R. (2022). *Virtual learning, now and beyond* (p. 14). Seattle, WA: The Center on Reinventing Public Education. Retrieved January 17, 2023, from https://crpe.org/wp-content/uploads/final2-Virtual-learning-post-COVID-report.pdf