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Virtual Schools in the U.S. 2013

Politics, Performance, Policy, and Research Evidence

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Virtual Schools in the U.S. 2013:
Politics, Performance, Policy, and Research Evidence

Alex Molnar, University of Colorado Boulder, Editor

Executive Summary

In the past decade, virtual education has 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 non-profit service providers, argue that virtual technology will revolutionize teaching and learning, dramatically reducing the cost and increasing the availability of high-quality education.

Virtual education 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 earlier failed. 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 traditional, in-person classroom instruction (blended instruction). Providers include public entities, non-profit and for-profit organizations.

At this point, technological and business model innovations have far outpaced research on the impact of virtual teaching and learning. Yet even though little is known about the efficacy of online education generally or about individual approaches specifically, states are moving quickly to expand taxpayer-funded virtual education programs.

Virtual Schools in the U.S. 2013: Politics, Performance, Policy, and Research Evidence is the first in a planned series of annual reports from NEPC. These reports will analyze the performance of full-time, publicly funded K-12 virtual schools; describe key policy issues raised by virtual education; assess the research evidence that bears on K-12 virtual teaching and learning; and provide research-based recommendations to help guide policymaking.

Introduction

Alex Molnar, University of Colorado Boulder

Discusses the context for virtual education reform; provides an overview of state legislative activity; describes the influences on policymakers; and surveys media reports of emerging political and policy issues associated with the implementation of virtual school policies.

Data from the National Conference of State Legislatures (NCSL) database as well as the information compiled by the Evergreen Group and by the Foundation for Excellence in Education detail considerable state level legislative activity associated with virtual education in 2012. A review of media reports illustrates the competing claims, conflicting goals, financial uncertainty, questionable political and business relationships, and lack of systematic data that characterize the current political and policy environment of virtual education.

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

Gary Miron, Western Michigan University
Brian Horvitz, Western Michigan University
Charisse Gulosino, University of Memphis

A total of 311 full-time virtual schools enrolling an estimated 200,000 students are identified; 67% of the identified students are enrolled in charters operated by Education Management Organizations (EMOs). In 2011-12, the largest for-profit operator of virtual schools, K12 Inc., alone enrolled 77,000 students.

Compared with conventional public schools, researchers found that full-time virtual schools serve relatively few Black and Hispanic students, students who are poor, and special education students. In addition, on the common metrics of Adequate Yearly Progress (AYP), state performance rankings, and graduation rates, full-time virtual schools lag significantly behind traditional brick-and-mortar schools.

Recommendations arising from Section I:

- Policymakers should slow or stop growth of virtual schools until the reasons for their relatively poor performance have been identified and addressed.
- Given that some for-profit companies now enroll more than 10,000 students, policymakers should impose caps on student enrollment at schools run by such companies until evidence of satisfactory performance for a provider is available.

- State education agencies and the federal National Center for Education Statistics should clearly identify full-time virtual-schools in their datasets, distinguishing them other instructional models.
- State agencies should ensure that virtual schools fully report data related to the population of students they serve.
- State and federal policymakers should promote efforts to design new outcome measures appropriate to the unique characteristics of full-time virtual schools.

Section II—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
Sheryl Rankin Shafer

Identifies the key challenges faced by policymakers as: funding and governance; instructional program quality; and recruitment and retention of high quality teachers.

Significant issues associated with funding and governance include linking funding to actual costs, identifying accountability structures, delineating enrollment boundaries and funding responsibilities, and limiting profiteering by EMOs.

Significant issues associated with instructional program quality include ensuring the quality and quantity of curricula and instruction, as well as monitoring student achievement.

Significant issues associated with the recruitment and retention of high-quality teachers include identification of appropriate skills for online teaching, designing and providing appropriate professional development, and designing appropriate teacher evaluation.

Recommendations arising from Section II:

- Policymakers should develop new funding formulas based on the actual costs of operating virtual schools.
- Policymakers should develop new accountability structures for virtual schools, calculate the revenue needed to sustain such structures, and provide adequate support for them.
- Policymakers should establish geographic boundaries and manageable enrollment zones for virtual schools by implementing a state-centered funding and accountability system.

- Policymakers should develop guidelines and governance mechanisms to ensure that virtual schools do not prioritize profit over student learning.
- Policymakers should require high-quality curricula, aligned with applicable state and district standards, and monitor changes to digital content.
- Policymakers should develop a comprehensive system of summative and formative assessments of student achievement, shifting assessment from a focus on time- and place-related requirements to a focus on student mastery of curricular objectives.
- Policymakers should assess the contributions of various providers to student achievement, and close virtual schools and programs that do not contribute to student growth.
- Policymakers should define certification training and relevant teacher licensure requirements and continually improve online teaching models through comprehensive professional development.
- Policymakers should address retention issues by developing guidelines for appropriate student-teacher ratios.
- Policymakers should use emerging research to create effective and comprehensive teacher evaluation rubrics.

Section III—Claims and Evidence: The Virtual Schools Research Base

Larry Cuban, Stanford University

Details common claims made by proponents of virtual education, and assesses the extent to which those claims are supported by sound research evidence.

To date, claims made in support of expanding virtual education are largely unsupported by high quality research evidence. The role of political considerations in driving the expansion of virtual technologies in public education despite a manifest lack of research support is examined. Suggestions for the kind of research that policy makers need are offered.

Recommendations arising from Section III:

- Policymakers should suspend requirements that students take online courses in order to graduate from high school.
- Policymakers should slow or stop growth of virtual schools until there is research evidence on their performance that supports their expansion.

- Policymakers should create long-term programs to support independent research and evaluation of specific student learning outcomes for cyber schools, blended learning schools, and similar ventures.

Virtual Schools in the U.S. 2013:
Politics, Performance, Policy, and Research Evidence

Introduction

Alex Molnar, University of Colorado Boulder

In the past decade, virtual education has moved quickly to the top of the K- 12 public education reform agenda. Virtual education advocates include foundations, for-profit and non-profit service providers, business leaders, and school reform organizations. Proponents argue that virtual technology will revolutionize teaching and learning, dramatically reduce the cost and increase the availability of high-quality education.

Goal of the Annual NEPC Virtual Schools Reports

The National Education Policy Center plans to address the need for an objective analysis of the performance of full-time, publicly funded K-12 virtual schools (or cyber schools) by publishing a series of annual reports.

Other organizations have also produced reports on virtual education. The annual *Keeping Pace* reports published by the Evergreen Group[1] are, for example, a useful resource for anyone interested in a descriptive overview of the growth of K-12 virtual education and the current K-12 virtual education landscape. The reports, however, have two important limitations. First, the Evergreen Group is a consultant to the online education industry.[2] It is not surprising, therefore, that its annual reports assume the value of virtual education and the desirability of its expansion. Second, the reports offer little in the way of independent research evidence on the impact of virtual technologies on teaching and learning; as a result, they offer little in the way of research-based guidance to policymakers.[3]

Digital Learning Now!, published by the Foundation for Excellence in Education, is less useful.[4] It is clear about its advocacy and its goal of persuading states to implement virtual education as quickly as possible. Indeed, the first of its 10 recommendations to policymakers is to "Use Digital Learning To Accelerate Education Reform."[5] It assigns a letter grade from "A" to "F" to each state based on how well the state has done at implementing the 10 "Elements" (encompassing 39 "Rubrics") that the report asserts are

There are outsized claims, intense conflicts, lots of taxpayer money at stake, and very little solid evidence to justify the rapid expansion of virtual education.

important in promoting virtual education and reforming education overall. The discussion of "Element" number 6, "Digital Instruction Is High Quality," for example, asserts without any apparent research evidence that "Breaking down the barriers to digital instruction can improve the quality of education, while at the same time reducing costs."[6] Although this report is clearly part of an advocacy campaign sponsored by the digital education industry and its supporters, and its "grading" system little more than the type of crude political rankings numerous advocacy organizations occasionally publish, *Digital Learning Now!* does contain some useful information such as state-by-state summaries of legislative activity that bears on digital learning policy.

In contrast to the *Keeping Pace* and *Digital Learning Now!* reports, NEPC reports will analyze the performance of full-time, publicly funded K-12 virtual schools; describe the policy issues raised by the available evidence; assesses the research evidence that bears on K-12 virtual teaching and learning; and offer research-based recommendations to help guide policymaking.

Virtual Schools in the U.S. 2013: Politics, Performance, Policy, and Research Evidence is the National Education Policy Center's first annual report on virtual education. This Introduction provides an overview of the relevant political and policy landscape. Section I presents original research on the size, scope, and performance of full-time K-12 virtual schools, with details on the largest providers. Section II takes up significant but unaddressed policy issues associated with finance, governance, instructional and teacher quality. Section III focuses on claims made about virtual technologies and their impact on teaching and learning and assesses the extent to which they are, or are not, supported by existing research. It also explores quality issues relevant to research on virtual education. Each of the three sections closes with recommendations for policymakers.

Recent Virtual School-Related State Legislative Activity

State legislatures across the country have passed numerous bills facilitating the expansion of multiple forms of virtual learning. Those forms include programs launched within the established public school system as well as alternative online programs enabled by state charter school laws. From 2001 to 2007, 22 bills enabling or expanding online charter schools became law.[7] While some laws allowed traditional "brick-and-mortar" schools to develop online programs, others, such as those enacted in Florida[8] and Georgia[9] in 2006, allowed alternative providers to establish publicly-funded online programs independent of the traditional public school system.

Many bills enacted between 2001 and 2007 focused on enabling or encouraging public schools to make greater use of online technologies. Arkansas 2005 HB 2566, for example,

established "The Arkansas Distance Learning Development Program." The National Conference of State Legislatures (NCSL) summarizes that law as follows:

> Establishes the Arkansas Distance Learning Development Program which seeks to alleviate the increasing shortage of available qualified teachers; provides additional course-scheduling opportunities for students currently forced to choose between courses that are scheduled infrequently or concurrently; provides an opportunity for students to access an enriched curriculum and additional courses beyond those mandated by the Standards for Accreditation of Arkansas Public Schools; and develops and makes available online professional development and instructional resources for all teachers and administrators.[10]

From 2008 onward, the NCSL database reflects a significant upsurge in legislative activity that expands online schooling, regulates virtual education, or modifies existing regulations. From 2008 to 2012, 157 bills that NCSL categorized as related to "distance/online/virtual learning" became law in 39 states, territories, or the District of Columbia.[11] A list of bills enacted and recorded in the NCSL database appears in Appendix A.

To date, the federal government has not inserted itself in any significant way into either the expansion or the regulation of virtual schooling. Instead, the policy activity of greatest consequence is occurring at the state level.

American Legislative Exchange Council (ALEC) Influence on State Legislation

In several states, ALEC has played a role in the enactment of laws expanding virtual schooling. The organization's involvement with such legislation is particularly noteworthy because a number of corporations seeking to profit from online schooling have played important roles in setting ALEC's policy agenda, according to research by the Center for Media and Democracy (CMD), a nonprofit group that monitors corporate influence on media and government. CMD reports, for example, that Mickey Revenaugh, the co-founder of Connections Academy and the company's senior vice president of state relations, is the private sector chair of ALEC's Education Task Force.[12] Connections Academy is an online schooling provider that contracts with charter schools, school districts and governmental entities. (A Georgia state representative, David Casas, is the public sector chair of the task force.[13]) The private sector chair of the task force's Special Needs Subcommittee is Lisa Gillis, director of government affairs and school development for Insight Schools Inc.,[14] owned since 2011 by one of the largest for-profit providers, K12 Inc.[15]

ALEC model legislation has been linked to laws expanding or implementing virtual schooling in Florida[16] and Tennessee,[17] among other states, and to legislation introduced though not yet enacted in a number of other states, including Arizona.[18] ALEC's model legislation invariably promotes privatization. For example, soon after passage of Tennessee's law making private virtual school operators eligible to receive public funds, K12 Inc. received a contract allowing it to provide virtual education to any Tennessee

student in grades K-12. It is worth noting that the state has also closed down a state-operated online education program.[19]

Evolving Political Issues Associated with Virtual Schools at the State Level

The National Conference of State Legislatures (NCSL) database as well as the information compiled by the Evergreen Group[20] and by the Foundation for Excellence in Education[21] detail considerable state-level legislative activity associated with virtual education in 2012. A review of media reports suggests that Arizona, Iowa, Louisiana, Maine, Ohio, and Pennsylvania are states where virtual education policy and practice has drawn a fair amount of public attention. The sampling of media reports and commentary from these states detailed below serves to illustrate the competing claims, conflicting goals, financial uncertainty, questionable political and business relationships, and lack of systematic data that characterize the current political and policy environment of virtual education.

Arizona

At the end of 2011, *The Arizona Republic* reported that some 36,000 students, or about 3% of the state's public school students, were enrolled in at least one online course. The newspaper's six-day examination of the industry included interviews with critics who said that the online courses and schools might be less rigorous than traditional schools. The series documented claims of lax oversight for online schools and raised questions about the ease with which students enrolled online could cheat; however, the publication fell short of a definitive assessment of the questions it raised about the quality of online schooling.[22] In May of 2012, Governor Jan Brewer vetoed legislation that would have expanded the state's online school programs but would also have increased state oversight of the schools' course offerings.[23]

Iowa

Two national virtual school companies began operating in Iowa for the 2012-2013 school year amid disputes about whether state law allowed their operation. Iowa's public schools may do only what state law expressly permits. As the *Des Moines Register* reported in 2012, Iowa law not only fails to grant explicit permission for schools to operate entirely online, it specifically forbids school districts to use "telecommunications. . . as the exclusive means to provide any course which is required by the minimum education standards for accreditation."[24] Top state officials disagreed about whether schools established by Connections Academy and K12 Inc. in partnership with two small local school districts were legal. Governor Terry Branstad said he believed they were, but the state attorney general, Tom Miller, was more cautious. Miller suggested that online schools would be permitted under state law if they met certain requirements, but until the two schools were operating, their compliance could not be determined. As of the 2012-

2013 school year, the two schools were operating, enrolling 302 students between them.[25] Iowa's governor also was seeking legislation in 2013 to expand the state's online education offerings, at a cost of $4.5 million.[26]

Louisiana

In March 2012, the Louisiana Board of Elementary and Secondary Education (BESE) expanded an enrollment cap for Louisiana Connections Academy from 750 to 1,000 students for the 2012-2013 school year. State school officials cited the school's report of 4,221 applicants for 2011-2012 as a reason to raise the cap. According to state Superintendent of Education John White, "Students would have to go to a low-performing school if we did not expand it."[27] The board ignored pleas from one of its own members, as well as from the Louisiana Association of Educators, to delay lifting the cap until the performance of students already enrolled in the school could be evaluated.

Superintendent White, however, embraces not only the expansion of online schools, but a broader conception that has been described as "à la carte" education that would seem to do away with the school as a coherent institution, replacing it with purveyors of individual classes and programs of study, often online. Reuters describes the design as follows:

> The model, now in practice or under consideration in states including Louisiana, Michigan, Arizona and Utah, allows students to build a custom curriculum by selecting from hundreds of classes offered by public institutions and private vendors.
>
> A teenager in Louisiana, for instance, might study algebra online with a private tutor, business in a local entrepreneur's living room, literature at a community college and test prep with the national firm Princeton Review—with taxpayers picking up the tab for it all.[28]

White came to the Louisiana department from New York City, where as a deputy chancellor at the Department of Education, he championed expansion of technology in education. New York's education department budgeted an increase in technology spending for 2012, including $542 million for rewiring city schools to accommodate more online learning and computerized standardized testing. At the same time, the department planned to cut $1.3 billion in school construction and lay off 4,600 teachers and reduce the teaching staff by a total of 6,100. "If we want our kids to be prepared for life after high school in the 21st century, we need to consider technology a basic element of public education," White told *The New York Times*.[29]

Maine

Maine has shown sharply increased interest in virtual schooling in recent years. Although published reports indicate the state has not yet authorized any virtual schools, Governor

Paul LePage, elected in 2010, issued an executive order on Feb. 1, 2012, to expand online schooling. The governor's action prompted the *Maine Sunday Telegram* newspaper to delve into the track record of such online schools as well as to plumb the relationships that helped influence the Republican governor's policy initiative. Reviewing more than 1,000 pages of email messages uncovered in a public records request, the newspaper found that

> . . . large portions of Maine's digital education agenda are being guided behind the scenes by out-of-state companies that stand to capitalize on the changes, especially the nation's two largest online education providers.
>
> K12 Inc. of Herndon, Va., and Connections Education, the Baltimore-based subsidiary of education publishing giant Pearson, are both seeking to expand online offerings and to open full-time virtual charter schools in Maine, with taxpayers paying the tuition for the students who use the services.[30]

The newspaper's investigation found that both companies were major funders of the Foundation for Excellence in Education, founded by former Florida Governor Jeb Bush. That foundation, the newspaper reported, played a significant role in persuading Maine's education commissioner, Stephen Bowen, of the merits of virtual public schools. Bowen, the newspaper found, met with Patricia Levesque, whom the *Sunday Telegram* described as "Bush's top education aide" and the person in charge of running the foundation. The article noted that Levesque "is paid through her private firm, which lobbies Florida officials on behalf of online education companies," and further, that the foundation's staff in Florida could recommend policies, model legislation and language for executive orders to be signed by the governor; it could also help with strategy to push through the legislation.[31]

Indeed, the foundation did supply the language that LePage used in his 2012 executive order, the newspaper concluded. Further, the American Legislative Exchange Council "developed digital learning legislation that was introduced by Maine lawmakers"; education commissioner Bowen was a former ALEC member prior to his appointment as the state's top education official.[32]

In an earlier article, Bush's aide Patricia Levesque was identified in *The Nation* as having what the article called a "clear conflict of interest" in her dual roles as a lobbyist for for-profit education companies and as someone encouraging philanthropic organizations to put their weight behind a variety of state bills to further open the door to education technology companies:

> Lobbyists like Levesque have made 2011 the year of virtual education reform, at last achieving sweeping legislative success by combining the financial firepower of their corporate clients with the seeming legitimacy of privatization-minded school-reform think tanks and foundations. Thanks to this synergistic pairing, policies designed to boost the bottom lines of education-technology companies are cast as mere attempts to improve education through technological enhancements, prompting little public debate or opposition. In addition to Florida, twelve states have expanded virtual school programs or online course

> requirements this year. This legislative juggernaut has coincided with a gold rush of investors clamoring to get a piece of the K-12 education market. It's big business, and getting bigger: One study estimated that revenues from the K-12 online learning industry will grow by 43% between 2010 and 2015, with revenues reaching $24.4 billion . . . [33]

A change in control of the Maine legislature in 2012 has forced a pause in the governor's move to introduce online schools in the state. Democrats now have majorities in both the state Senate and the state House of Representatives. They have introduced legislation to block the establishment of full-time online schools. One bill would put a moratorium on full-time online schools, as well as on for-profit online schools, until completion of a study to draw up "best practices" by the state's charter school commission. And one Maine legislator has proposed a bill banning for-profit online schools outright, requiring them to be run instead by the state or by existing school districts.[34]

Ohio

In mid-2012, the Cleveland *Plain Dealer* reported that online school enrollment in Ohio had topped 30,000 students[35]—making the state, at least by some calculations, second only to Arizona in the number of its students enrolled in online schools.[36] In a follow-up item, the *Plain Dealer* also reported that online schools in the state were paid $209 million in public money for the 2010-2011 school year, but that they "don't have to give a detailed accounting of their expenses to the state. The schools don't talk much about their books either."[37] The newspaper noted that a 2011 report from Innovation Ohio, a progressive think tank, criticized the state funding of online schools as well as the lack of transparency in that funding.[38] In a separate development, Ohio illustrates what has been a recurrent rift between the virtual schooling industry and at least a segment of the traditional homeschooling population, when the Home School Legal Defense Association (HSLDA) in 2012 issued a notice to members stressing the difference between online public schools and homeschooling:

> Homeschooling enables parents to have much more influence on their children's education. Publicly funded virtual charter schools are really just "schools at home" and parents are simply "monitors or learning coaches." In these schools the government is in the driver's seat—parents are just along for the ride. HSLDA encourages parents to count the cost before enrolling in "free" publicly funded virtual charter schools.[39]

Pennsylvania

In Pennsylvania, the 2012-2013 school year began with a total of 16 "cyber charter schools" operating in the state, up from 13 the previous year. The expansion of charter schools led a number of the state's traditional public schools to step up various tactics aimed at stemming the flight of students to the online alternatives.[40]

By December 2012, eight proposals were pending before the state Department of Education to establish additional cyber charter schools in the state.[41] At public hearings in the state capital of Harrisburg, state education secretary Carolyn Dumaresq praised the growth of online schools: "The beauty of the cyber charter is that any child, anywhere in Pennsylvania can participate. I think they serve a unique role in providing additional opportunities for students."[42]

In contrast, the Education Law Center, a Philadelphia- and Pittsburgh-based nonprofit that promotes access to educational opportunities for the poor, minorities, and the disabled,[43] advocated for a statewide moratorium on new online charter schools.[44] "We have to make sure that children are protected and that taxpayers are protected," said the center's executive director, Rhonda Brownstein.[45] Meanwhile, published reports found that of 12 online charter schools already operating in Pennsylvania, only one made Adequate Yearly Progress (AYP) in 2012 under terms set by the No Child Left Behind Act. For 2011, only two made AYP.[46]

Research conducted by the Center for Research on Education Outcomes (CREDO) at Stanford University examined the performance of Pennsylvania charter schools and found that 100% of cyber charters performed "significantly worse than their traditional public school counterparts in both reading and math."[47] Meanwhile, as state Auditor General Jack Wagner prepared to leave office, he told a public radio station that the state has spent too much money on a total of 16 cyber charter schools.

> There is excess public money being spent to educate a child that sits at home and goes to school on a computer compared to a child that goes to school at a school district," Wagner told an interviewer from WESA-FM radio in Pittsburgh. Wagner, according to published reports, has argued that because they bear significantly lower costs for buildings and other physical infrastructure, cyber charters get more money than they need: "There is over $300 million in public taxpayer dollars being lost each and every year due to the flawed funding formula for charter and cyber charter schools.[48]

The *Philadelphia Daily News* reported on the case of Frontier Virtual Charter High School, which the newspaper said was forced by the state to surrender its charter because

> Frontier didn't supply students with promised laptops, printers and Internet reimbursements, the state said. The school's administrators didn't properly monitor attendance, truancy and grades, according to investigators. A "significant" amount of money was spent on nonschool expenses, the state said, including trips to restaurants and cash purchases that weren't backed with the receipts. The school failed to provide many of the classes it had offered students.[49]

For-Profit Virtual Schools Issues

Virtual education has always been seen by some as a business opportunity that could prove extraordinarily profitable for entrepreneurs, while lowering education costs. In 1993, Lewis J. Perelman, writing in the magazine *Wired*, explicitly framed the idea of converting education from the province of traditional public schools into a new, for-profit industry that would deliver its services largely online. "Dear Information Industry Executive," Perelman opened his article. "Could your business benefit from a few hundred billion dollars in new sales? Good. Let's talk."[50]

In the article, Perelman, a consultant based in Washington, D.C., whose online biography describes him as a "a strategic analyst, consultant, author, publisher, teacher, and thought leader,"[51] summarized the then-conventional wisdom that in the world economy, "knowledge-based businesses" were taking the place of "production-based businesses as the core of economic activity," and that a new "mega-industry" of enterprises was developing in computing, multi-media, and digital technology. He confidently asserted that

> . . . schools are one of the principal barriers to the growth of not only this new industry, but the whole world economy. Replacing the bureaucratic empire of educational institutions with a high-tech commercial industry will pull the cork out of the knowledge-age bottleneck—opening up an annual market worth $450 billion in the US alone. . . [T]he real threat posed to our economy by education, schools and colleges is not inadequacy, but excess: too much schooling at too high a cost.[52]

Seventeen years later, writing in *Forbes*, Clayton M. Christensen and Michael B. Horn echoed a similar theme, bringing it up to date and framing the shift to online schooling as both beneficial and inevitable in light of tightening school budgets:

> Many schools have framed the looming cuts as a threat to how they operate—even though the teaching force has grown by 10% since 2000, while student enrollment increased by only 5%. But others are seeing the hardship of the moment as an opportunity to transform what they do with the implementation of online learning. Pressured by not only widespread cuts but also increasing demands for accountability, these innovative leaders recognize that online learning is a key reform for doing more with less.
>
> For example, the people who run many schools realize that they can save considerably by cutting back on traditional classroom versions of non-core courses--advanced placement, foreign language, economics and so forth—and instead offer them online, thereby aggregating demand across many school districts. Likewise they can cut back on the number of periods during which they offer certain classroom courses and still affordably meet student demand by offering those courses online.

> More than 70% of school districts already offer some form of online learning, and that number is growing among traditional brick-and-mortar middle and high schools. With big budget cuts looming, online learning is likely only to grow, as students increasingly look to it to for courses they want to take and credits they need for graduation. Many of the leading online learning providers have experienced sharp growth over the past few years, and that's unlikely to slow.
>
> The adoption of online learning is much more than just a cost-saving move for school districts. It has the potential to transform schooling more broadly by allowing students access to a wide range of high-quality offerings and teachers, regardless of where they live. Some students whose classroom courses have been replaced with online versions will be thrilled to find out that they now have access to not just one provider's online courses but a whole marketplace of high-quality options, in a naturally technology-rich environment quite compatible for them.[53]

Given the focus on the profits to be had in virtual education, it is hardly surprising that firms were looking for ways to supplant teachers with technology were investing heavily in advertising their products and services, and that state policymaking and regulation had not kept pace with the changes underway.

In August 2012, John Katzman, the founder of the Princeton Review test-preparation company, was pointing investors toward companies developing software to replace teachers: "How do we use technology so that we require fewer highly qualified teachers?"[54] Reuters noted that venture capital firms had already put $9 million into Schoolology, which the Reuters correspondent described as "an online learning platform that promises to take over the dreary jobs of writing and grading quizzes, giving students feedback about their progress and generating report cards."[55]

A *USA Today* review of online school data concluded that, nationally, the corporate owners of online schools were spending "millions in taxpayer dollars on advertising. . . to attract students, even as brick-and-mortar public schools in the districts they serve face budget crunches."[56] The article noted that the money spent on TV, radio, newspaper and Internet advertisements came from taxpayer receipts that had been funneled to the online operations as a consequence of contracts with state or local public school agencies.[57]

Basing its conclusions on data compiled by Kantar Media, the newspaper estimated that, since 2007, the 10 largest for-profit, online school firms had spent $94.4 million on advertising, and that K12 Inc. "has spent about $21.5 million in just the first eight months of 2012." (A K12 spokesman who responded to *USA Today's* inquiries would neither confirm nor deny the figure, saying: "We try our best to ensure that all families know that these options exist. . . It's really about the parents' choice—they're the ones that make the decision about what school or program is the best fit for their child.") The newspaper also found that, in addition to media aimed at adults, K12 appeared to be "working to appeal to

kids," with media buys on Nickelodeon, The Cartoon Network, and MeetMe.com, a teen-oriented social networking site.[58]

National Public Radio's Ohio State Impact project localized the *USA Today* story to Ohio, where NPR/Ohio State Impact and the Cleveland *Plain Dealer* newspaper had earlier jointly reported on the online school industry. In that earlier report, the NPR and *Plain Dealer* team had calculated that, while the state paid online charter schools $6,300 per student, it was possible to run an online school for about $3,600 per student, raising the question of "what happens to the rest of the money?"[59]

K12 Inc. found itself as well at the center of several other controversies. In Colorado, K12 Inc.'s Colorado Virtual Academy, with 5,000 students, was denied in its application to transfer to the Colorado Charter School Institute (Colorado CSI).[60] CSI is an independent state agency that authorizes charter schools in the state; under Colorado law, charter schools must be authorized either by local school districts or by CSI.[61] In explaining its decision to reject the application, the institute cited concerns about: student performance below the 10th percentile statewide; student turnover of 25% for elementary and middle-school students and 50% for high school students; failure to follow through on a rubric for holding K12 Inc. accountable; and, curricular adjustments needed to serve a student body that was increasingly made up of at-risk students.[62]

In November 2012, Georgia's Department of Education told the Georgia Cyber Academy it would move in April 2013 to close the online charter school unless the academy undertook a series of changes in its dealing with special education students.[63] The department cited concerns including the school's failure to obtain Individualized Education Plans for special education students, its failure to offer federally required individualized instruction to special education students, and its failure to resolve complaints from parents.[64] The *Atlanta Journal-Constitution* noted that the Cyber Academy's 12,000-student enrollment made it "the largest public school in the state,"[65] as well as by far the largest of Georgia's three online schools.[66] The news reports, however, omitted the fact that the Cyber Academy is part of the K12 Inc. network.[67] Despite the harsh criticism in the state education department report, however, just two weeks after it was issued, the department altered its stance considerably and gave the school an extension to produce its special education plan and provide related documentation.[68]

And, shareholders have filed a class-action lawsuit against K12 Inc., claiming that the company had manipulated its stock price by concealing information about high student attrition and poor academic performance. Anonymous "confidential witnesses" who were described as former employees claimed that "K12-managed schools aggressively recruited children who were ill-suited for the company's model of online education. . . then manipulated enrollment, attendance and performance data to maximize tax-subsidized per-pupil funding," according to a joint report about the lawsuit by WHYY FM, a Philadelphia public radio station, and the Philadelphia Public School Notebook.[69]

In Wisconsin, a *Green Bay Press Gazette* investigation found that the state had not followed through on a recommendation from the nonpartisan state Legislative Audit

Bureau two years before calling for a state analysis of the performance of virtual schools compared with brick-and-mortar schools. A spokesman for the state Department of Public Instruction, which had been urged to conduct the analysis, told the Gannett newspapers that the agency had not done so because the state legislature had failed to provide either a statutory authority or the necessary funding to carry out the task.[70]

The *Press Gazette* also found that Wisconsin online schools had turned away from for-profit providers in favor of building their own programs. "Four of the state's largest virtual schools were run by for-profit companies last year, but this year that number is down to two,"[71] the newspaper reported in August. The two remaining were identified as K12 Inc., working with the Wisconsin Virtual Academy in McFarland (near Madison), and Connections Academy, working with Wisconsin Community Connections Academy in Appleton.[72]

The newspaper described the parting between two other schools and K12 Inc. after the 2011-2012 school year as "acrimonious splits."[73] The principal of one ex-K12 Inc. online school told the newspaper that, to the company, "the interest of their shareholders is the most critical deciding factor when decisions are being made."[74]

Public disaffection with online school surfaced as well in Idaho, where voters in the November 2012 election rejected overwhelmingly three ballot measures proposed as education reform initiatives by Idaho Superintendent of Public Instruction Tom Luna and Governor Butch Otter. In addition to turning away restrictions on teachers unions and a plan to tie teacher bonuses to test scores, residents voted 2-1 against a measure to require every Idaho high school student to use a laptop (funded by taxpayers) and take some courses online. Although the measure didn't directly relate to for-profit online schools, there seems little doubt that, had it passed, it would have created a market opportunity for such ventures. In addition, Luna and Otter disclosed in the weeks before the election a $180 million, eight-year contract with computer manufacturer Hewlett-Packard.[75]

The Need for Independent Research to Inform Policymaking

Even a cursory review of media reports and a passing acquaintance with the research on virtual education reveals that policy is being made in an environment much like the legendary "wild west." There are outsized claims, intense conflicts, lots of taxpayer money at stake, and very little solid evidence to justify the rapid expansion of virtual education, as will be documented in the coming sections of this report.

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While the database includes links to individual state websites where at one point the texts of laws might be found, because of its age many of the links no longer function.

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Summary text:

> Establishes the K-8 Virtual School Program to deliver academic instruction using online and distance learning technology to full-time students in kindergarten through eighth grade. Provides program requirements for student and school eligibility, conditions for participating in the program, funding, and student assessment. Provides for school accountability and grounds for nonrenewal and termination of contracts with participating schools. Finally, the bill provides for the continued participation of current schools.

9 Summary of Georgia 2006 SB33 (2007, Oct. 9). Education legislation database: Education enacted legislation (2001-2007). National Council of State Legislatures (search on state: "Georgia"; bill type: "Senate Bill"; bill

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Summary text:

> Amends the "Quality Basic Education Act," so as to change certain provisions relating to determination of enrollment by institutional programs. Authorizes the establishment of the Georgia Virtual School. Provides for rules and regulations. Provides for a Georgia Virtual School grant account. Provides for statutory construction.

Summary of Georgia 2006 SB610 (2007, Oct. 9). Education legislation database: Education enacted legislation (2001-2007). National Council of State Legislatures (search on state: “Georgia”; bill type: “Senate Bill”; bill number: “610”). Retrieved August 23, 2012, from http://www.ncsl.org/issues-research/educ/education-legislation-enactments-2001-2007.aspx/.

Summary text:

> Relates to waiver of provisions of Title 20 for charter schools, requirements for operating charter schools, and the control and management of charter schools, so as to provide that nothing shall preclude the use of computer and Internet based instruction for students in a virtual or remote setting.

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It is likely that the total number is somewhat overstated. The total number of bills listed can include Senate and House versions of the same legislation; it can also include several different bills that were subsequently combined. For instance, if three separate bills are filed in a state and subsequently merged into a single piece of legislation, all three might be recorded as “enacted” even though they all became absorbed into one new law, rather than three. Nonetheless, the volume of legislation involving online schools was sufficient to lead the NCSL to add “distance/online/virtual learning” to its menu of legislation topics for 2008 onward. See the preceding note.

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

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Virtual full-time K-12 schools, also known as cyber schools or online schools, are schools that deliver all curriculum and instruction via the Internet and electronic communication, usually with students at home and teachers at a remote location, and usually with everyone participating at different times. Although increasing numbers of parents and students are choosing this option, little is known about virtual schooling in general, and very little about full-time virtual schools in particular. For example, information has not been available on such basic questions as the number of virtual elementary and secondary schools operating, the number of students enrolled in them, and the rate at which they have expanded. Moreover, despite a dearth of research evidence useful in shaping policy, many states have adopted legislation permitting full-time virtual schools or removing the caps that once limited their growth.[76]

The little that is known comes primarily from the investigative efforts of journalists.[77] The following description, then, is a first research-based attempt to provide a comprehensive inventory and overview of full-time virtual schools in the U.S. It builds on an earlier NEPC study that analyzed the students and performance of one large provider, K12 Inc.[78] Here, that analysis is expanded to include all full-time virtual schools in the U.S. for which data are available for the 2011-12 academic year and to provide an estimate of their growth.

Also included is a portrait of the students enrolled in virtual schools, including details on grade level, ethnicity, gender, socioeconomic status, special education status, and English language learning status. Information on virtual school performance is included as well, with a comparison of aggregate performance ratings and national norms. Based on findings in these areas, recommendations follow.

Details for specific virtual schools appear in Appendices B-D, which can be downloaded from the NEPC website: http://nepc.colorado.edu/publication/virtual-schools-annual-2013.

Questions addressed include:

- How many full-time virtual schools operate in the U.S.? How many students do they enroll?
- What are the demographic characteristics of students enrolled in full-time virtual schools? Within individual states, how do demographic data differ for students enrolled in virtual schools and those enrolled in brick-and-mortar schools?
- How do full-time virtual schools perform in terms of student achievement relative to other public schools?

Data Sources and Selection Criteria

The findings presented below are based on publicly available data, collected, audited, and warehoused by public authorities.

The scope of the study is limited to full-time, public elementary and secondary virtual public schools serving U.S. students. This includes virtual schools operated by for-profit Education Management Organizations (EMOs) as well as virtual schools operated by states or districts. Private virtual schools are excluded. Also excluded are schools offering a combination of full-time virtual programs and blended programs, unless it was possible to separate data for the full-time virtual school component.

Schools were typically identified by the unique school ID code assigned by the National Center for Education Statistics (NCES). Relatively new schools (those opening in 2011 or more recently) were identified by the unique building or school ID codes assigned by the relevant state education agencies. Only schools reporting at least one student enrolled during the 2011-12 school year were included (see notes in the appendices for more details regarding criteria for inclusion) These criteria helped identify and exclude smaller programs operated by districts or schools not intended to be full-time virtual schools.

The primary sources for total enrollment and school performance data were state-level datasets and school report cards for the 2011-12 school year. Data for grade level enrollment, race-ethnicity, and sex were obtained from NCES and represent the 2010-11 school year. The most recent year for which the data are available.

Aggregated data reflect weighted averages based on enrollment. That is, averages have been calculated so that the influence of any given school on the aggregated average is proportional to its enrollment. Comparisons were made to norms for all public schools in the United States.

Limitations

There are several general limitations that readers should keep in mind.

Incomplete demographic data. The tables in the appendices have several gaps that reflect missing data. Some states combine virtual school data with local district data in ways that make disaggregation impossible. For example, while data on student ethnic background and on free-and-reduced-price lunch status are rather complete, the special education data are not. This was particularly problematic in states where charter schools are not considered Local Education Authorities or districts, and thus did not have the legal responsibility to provide special education services. Also, some states combine charter school data with local district data, which makes it impossible to parse the numbers for only full-time virtual schools.

Comparison groups. National aggregate results for all public schools provide the base for comparisons in this report, which profiles virtual schools in 28 states. While comparisons of two inherently different forms of schooling, each representing different geographic datasets, have some obvious weaknesses, national aggregate data is what state and federal agencies typically use in their reports and comparisons. Following the agencies' lead is intended to allow reasonable comparison of this report with others. An additional consideration is that, because the 28 states represented are among the nation's largest and most densely populated, the national comparison is informative, if not perfect. It is perhaps also worth noting that the national data include data for full-time virtual schools, although it constitutes a relatively small subset.

Instability in virtual schools. Full-time virtual schools are rapidly evolving; currently, the number of such schools, their demographic composition, and their performance data could vary from the 2010-11 demographic data and the 2011-12 performance data presented here (the most recent available for each category). When the fluidity of the terrain is layered onto the scope of this first attempt at composing a national portrait, some errors of inclusion and exclusion appear likely. Documented corrections to the data in the appendices are welcome and can be submitted to the authors through the National Education Policy Center.

Growth and Current Scope of Full-Time Virtual Schools

While many types of online learning are expanding, full-time virtual schools are gaining the most attention. They are not simply a means to supplement and expand the courses available in traditional brick-and-mortar schools. Instead, they are being used to expand school choice, concurrently advancing privatization, entrepreneurism and private financial investment. With key providers lobbying legislatures vigorously and national organizations promoting school choice, virtual schooling now has a firm foothold: 30 states and the District of Columbia allow full-time virtual schools to operate,[79] and even more states allow, or in some cases require, one or more courses to be delivered online to public school students.

Research for this report identified 311 full-time virtual schools operating during the 2011-2012 academic year, enrolling nearly 200,000 students (see appendices C or D for a list of identified schools). Frequently, these schools are organized as charter schools and

operated by private EMOs. Although this is the case for only 41% of full-time virtual schools, they account for 67% of all enrolled students. Among the schools in this inventory, 64% are charter schools and 36% are operated by districts or—in a few instances—by state agencies.

Figure 1.1 illustrates the estimated enrollment growth in full-time virtual schools over the last 12 years. Estimates for past years are based on two sources, NEPC's annual Profiles of EMOs reports and the Keeping Pace reports prepared by Evergreen Education Group (a consulting firm that prepares an annual review of policy and practice for online learning).[80] While the International Association for K-12 Online Learning suggests that as many as 250,000 are enrolled in full-time virtual schools in 2011-12, this inventory indicates that total enrollment is still below 200,000. (See Appendix B for student enrollment by state.)

In contrast to original estimates of enrollments in full-time virtual schools that appear high, earlier estimates of the number of full-time virtual schools appear low. That is because scores of relatively small district-run virtual schools have been identified.

Although virtual schools still account for a relatively small portion of the overall school choice options in the U.S., they now constitute one of the fastest-growing forms of school choice.[81] It is important to note that virtual schools, as a category of school choice, overlap with both homeschooling and charter schools. Most virtual schools are organized as charter schools, although an increasing number of district and state education agencies are now starting full-time virtual schools.

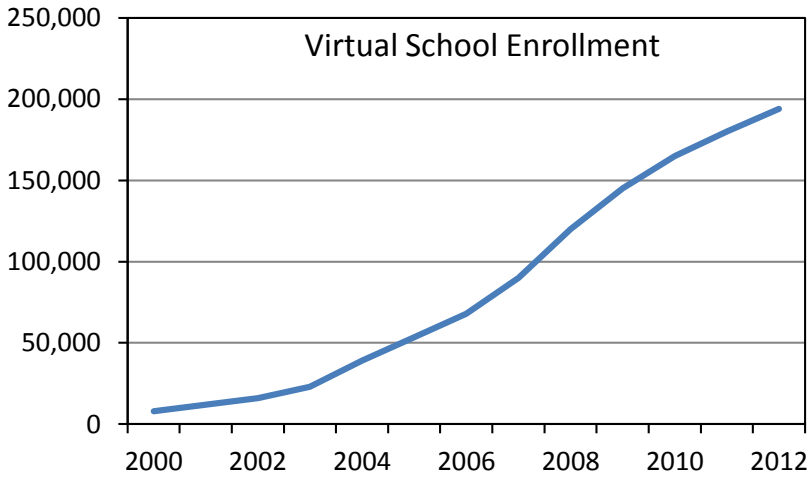

Figure 1.1. Estimated Enrollment Trends in Full-Time Virtual Schools

Private for-profit EMOs have played an important role in expanding the number of virtual schools, operating 95 on behalf of charter school and district school boards (see Table 1.1). K12 Inc. is by far the largest EMO in this sector.[82] In 2011-12, K12 Inc. alone operated 58 full-time virtual schools enrolling close to 77,000 students. Connections Academies is the second largest for-profit operator, with 21 schools and more than 27,000 students in 2010-11. Note that only those schools where the provider has full control and responsibility for the virtual school and its educational program are included in this inventory. The role of some large for-profit EMOs in public schools is actually larger than illustrated here, because many districts contract with them to provide online curriculum or other support services.

The virtual schools operated by the for-profit EMOs are very large, with an average enrollment of about 1,400 students.

Table 1.1. Numbers of Virtual Schools and Students in 2011-12

	Schools	Students	Percent of all Enrollment	Average Enrollment Per School
For-profit EMO	95	133,128	66.7%	1,401
Nonprofit EMO	9	2,156	1.1%	240
Independent	207	64,309	32.2%	311
Total	**311**	**199,593**	100%	642

A number of other EMOs have emerged to operate full-time virtual schools, such as Insight Schools and Kaplan Virtual Education, but these two for-profit companies are now owned by K12 Inc. The largest nonprofit EMO, Learning Matters Educational Group, operates four full-time virtual schools. Some EMOs that formerly operated only brick-and-mortar schools are now expanding to include full-time virtual schools. These include Mosaica Inc., Edison Schools Inc., Leona Group LLC., and White Hat Management, LLC. Given the relatively lucrative circumstances under which full-time virtual schools can operate,[83] it is likely that more for-profit EMOs will be expanding their business to include full-time virtual schools.

As the data in Table 1.1 indicate, the virtual schools operated by the for-profit EMOs are very large, with an average enrollment of about 1,400 students. Full-time virtual schools operated by nonprofit EMOs and non-EMO virtual schools enroll on average 240 and 311 students, respectively.

Student Characteristics

To provide context for school performance data comparisons discussed later in this report, following is an analysis of student demographics.

Race-Ethnicity

Aggregate data from the full-time virtual schools look rather different from national averages in terms of student ethnicity. Three-quarters of the students in virtual schools are white-non-Hispanic, compared with the national mean of 54% (see Figure 1.2). The proportion of Black and Hispanic students served by virtual schools is noticeably lower than the national average. Only 10.3% of the virtual school enrollment is Black while 16.5% of all public school students

are Black. An even greater discrepancy is found among Hispanic students, who comprise only 11% of the virtual school students but 23.7% of all public school students. Because virtual schools have a large presence in states with large Hispanic populations, such as Arizona, California, and Florida, this finding is surprising. It appears that virtual schools are less attractive to Hispanics, or perhaps that virtual schools are doing less outreach or marketing to this population.[84] This may also be due to evidence that suggests lower success rates for minority populations in online schooling.[85]

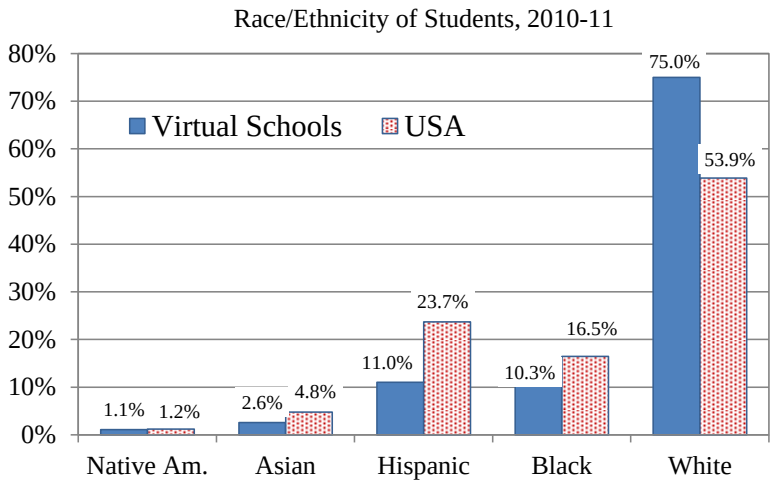

Figure 1.2. Race/Ethnicity of Students in Virtual Schools Compared with National Averages, 2010-11

Sex

While the population in the nation's public schools is nearly evenly split between girls and boys, the population of students in virtual charter schools overall skews slightly in favor of girls (52.5% girls and 47.5% boys.) Virtual schools catering to students in elementary and middle school tend to be more evenly split between boys and girls, but high schools are likely to have a larger proportion of boys. Charter schools and for-profit EMO-operated schools tend to have slightly more girls than boys enrolled.

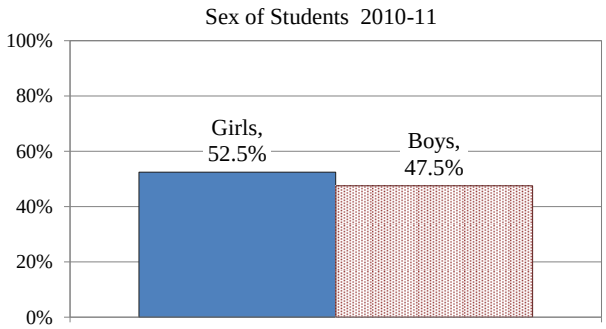

Figure 1.3. Sex of Students in Virtual Schools, 2010-11

Free and Reduced-Price Lunch, Special Education, and English Language Learner Status

As illustrated in Figure 1.4, the proportion of students qualifying for free or reduced-price lunch (FRL) in virtual schools is 10 percentage points lower than the average for all public schools: 35.1% compared with 45.4%. Of those schools reporting data, 13% (36 schools) enrolled a higher percentage of FRL students than the national average, while 87% (250

schools) of reporting schools indicated a lower percentage. In general, then, virtual schools serve a lower percentage of economically disadvantaged students than other public schools.

Figure 1.4 also illustrates the representation of students classified as special education, indicating they have a disability as well as a recorded Individualized Education Plan (IEP). Overall, the proportion of students with disabilities in the virtual schools is around half of the national average, or 7.2% compared with 13.1 %. Only 92 schools reported special education data.[86] Of these schools, 11.5% (10 schools) have a higher proportion of students with disabilities than the national average, while 88.5% (82 schools) had a lower than average proportion of students with disabilities.

Given that charter schools overall usually have a substantially lower proportion of students with disabilities compared with district schools or state averages,[87] one might expect an even greater difference in virtual school enrollments because it seems more difficult to deliver special education support via the Internet. However, the populations of students with disabilities served by virtual schools and traditional public schools likely differ substantively in terms of the nature and severity of students' disabilities. Past research has established that traditional public schools typically have a higher proportion of students with moderate or severe disabilities while charter schools have more students with mild disabilities that are less costly to accommodate.[88]

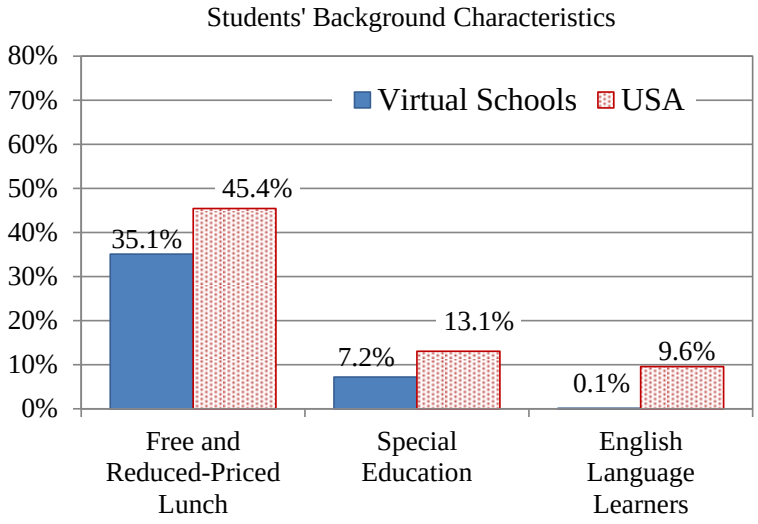

Figure 1.4. Students Qualifying for Free and Reduced-Priced Lunch, Classified as Special Education, or Classified as English Language

English language learners represent a growing proportion of students in the nation's schools, especially in the states served by virtual schools. However, only 0.1% of full-time virtual school students are classified as English language learners (ELLs). This is a strikingly large difference from the 9.6% national average (see Figure 1.4). None of the virtual schools had higher proportions of ELLs than the national average, and the ELL student enrollment of most virtual schools with data available was less than 1%.

Specific demographic data for each of the full-time virtual schools can be found in Appendix C. Appendix C also reports the number of schools considered to calculate the weighted means.

Enrollment by Grade Level

Figure 1.5 depicts the enrollment distribution of students in virtual schools by grade level, compared with national averages. A disproportionate number of students are in high school, where the enrollment drops off sharply after ninth grade. Given the comparatively

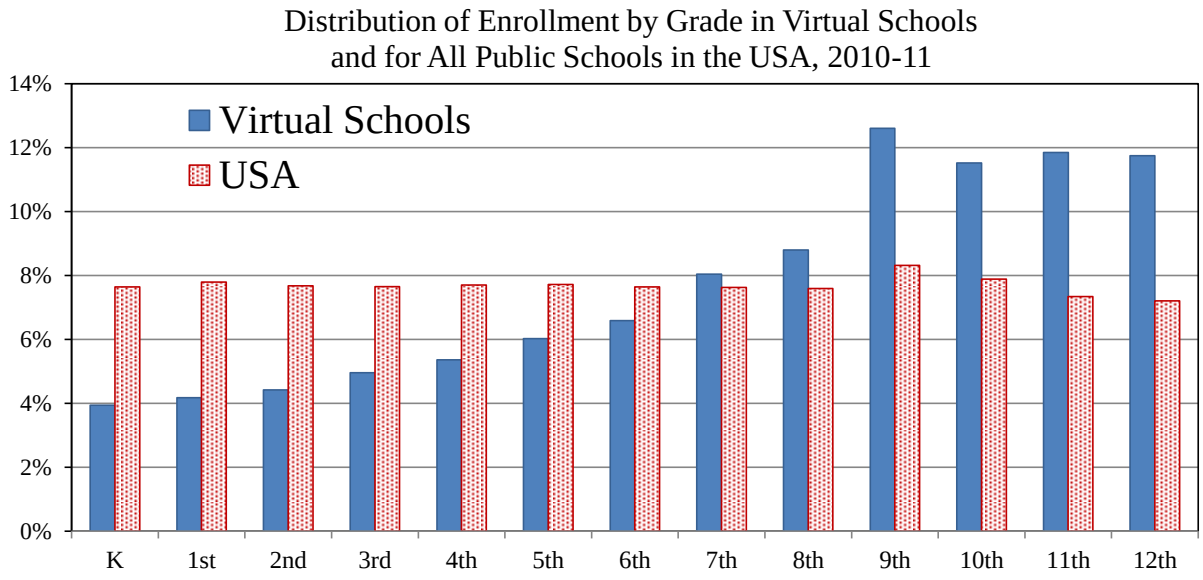

Figure 1.5. Enrollment by Grade Level for Virtual Schools and for U.S., 2010-11

equal size of age cohorts in the nation's population, an even distribution of students across each grade is evident for the whole country, although there is a gradual drop off from grades 9 to 12. Note that in the national population there is a slight increase at grade 9 which is due to some students not obtaining enough credits to be classified as 10th graders. Starting in grade 10, however, the enrollment per grade decreases slightly by grade, reflecting the nation's dropout problem.

Charter virtual schools and EMO-operated virtual schools tend to serve more students at elementary and middle school grades, while district operated virtual schools focus more on the high school grades. This may reflect a tendency for charter schools to cater more to home schooled students while districts that develop virtual school programs design them for older students who may require supplemental or alternative programs. The extra costs involved with upper-secondary schools may be another factor that explains why charter virtual schools less often cater to students in high school grades.

The drop in virtual school enrollments in the high school grades is likely a result of students transferring to brick-and-mortar schools as well as students dropping out of

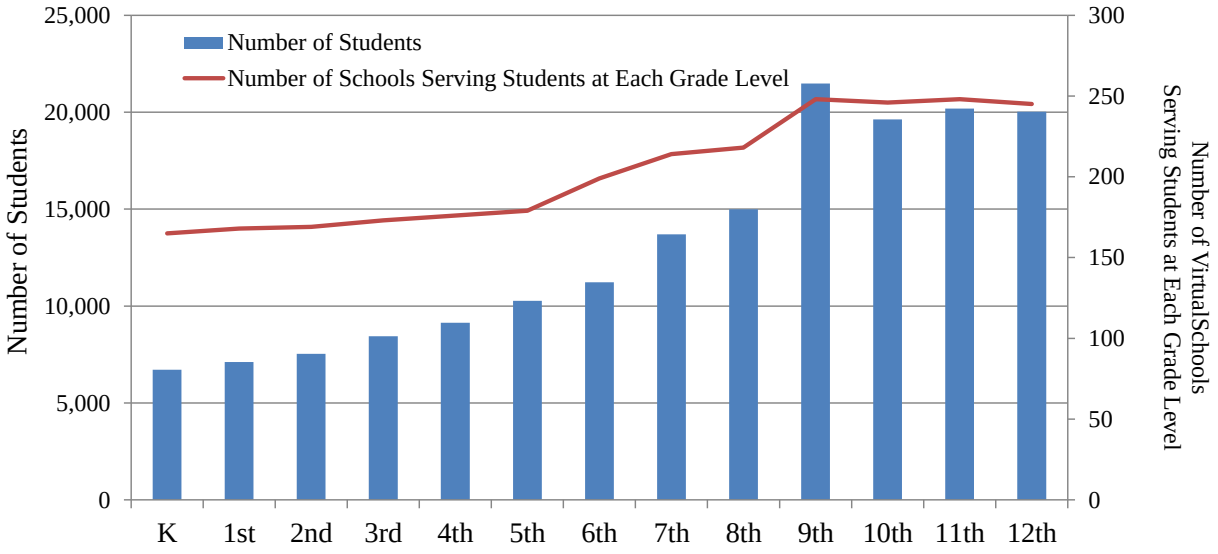

Figure 1.6. Number of Virtual School Students Per Grade Level and Number of Schools that Offer Instruction at Each of the Grade Levels

school. Another contributing factor may be that some newer virtual schools have not yet fully expanded to include all grades. Also, a portion of the virtual schools cater specifically to students that drop out of brick-and-mortar schools, which can also help to explain the larger numbers of students enrolled in the high school grades. Many of these are operated by districts.

Whereas Figure 1.5 depicts the percentage of total enrollment by grade, Figure 1.6 illustrates the actual number of students virtual schools serve at each grade level.[89] An increase appears up until grade 9, and then a noticeable decrease appears between grades 9-12. The number of schools serving high school students is relatively consistent, however, decreasing only slightly in the upper grades. This indicates that a large portion of virtual schools have classes in grades 9 to 12, but the grade cohort drops after the ninth grade. As noted earlier, this could be a result of some schools not having fully implemented their enrollment plans across all high school grades. Nevertheless, based on the low graduation rates in virtual schools—discussed below—decreasing high school enrollment is also explained by a relatively large proportion of students who drop out.

School Performance Data

This section is an overview of key school performance indicators, including Adequate Yearly Progress (AYP) status, state ratings, and on-time graduation rates. Comparisons across these measures suggest that virtual schools are not performing as well as brick-and-mortar schools.

Adequate Yearly Progress and State Ratings Assigned to Virtual Schools

The 2011 and 2012 NEPC profiles of EMOs provided the AYP results and state performance ratings discussed here.[90] Although these are weak measures of school performance, they provide descriptive indicators that can be aggregated across states.

AYP is essentially intended to demonstrate whether or not a public school meets its respective state standards. However, it is a relatively crude indicator that covers academic as well as non-academic measures, such as school attendance and the percentage of students taking a state exam.

In the 2010-2011 school year, there was a 28 percentage point difference between full-time virtual schools meeting AYP and traditional brick-and-mortar district and charter schools that did: 23.6% compared with 52%, respectively.[91] Although the virtual school average was higher in the other two years illustrated, the gap in AYP between virtual and traditional schools has recently hovered around 22 percentage points, offering no evidence of an improvement trend. This suggests that the need for more time to meet goals may not be a sufficient explanation for the large difference.

In addition, AYP ratings were substantially lower for virtual schools managed by EMOs than for brick-and-mortar schools managed by EMOs: 29.6% compared with 51.1%.

One should be cautious in drawing conclusions from such an imperfect measure, and one should be cautious in interpreting differences among groups of schools. At the same time, it appears evident that extremely large differences, such as the 22 percentage point difference between full-time virtual schools and brick-and-mortar schools meeting AYP, warrants further attention. (See Figure 1.7).

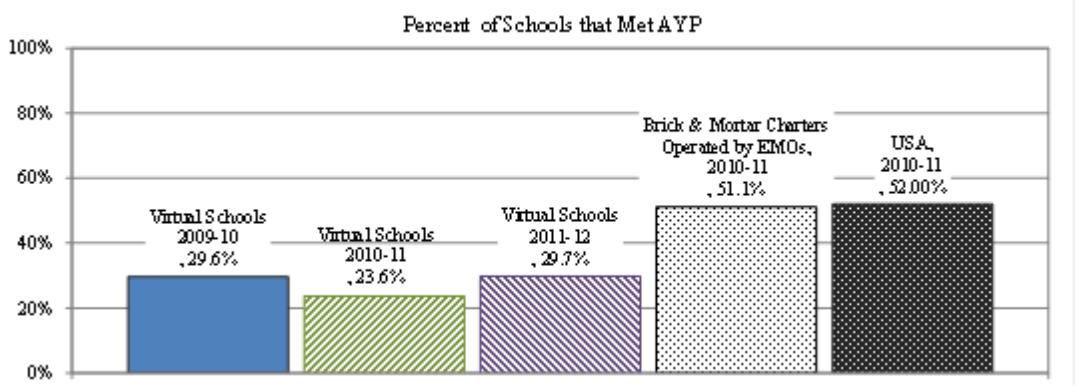

Figure 1.7. Percentage of Schools Meeting Adequate Yearly Progress, by School

Of course, there are variations among individual schools and companies represented in the virtual school cohorts discussed here. A few operators of full-time virtual schools have particularly dismal results. For example, only 5% of the virtual schools operated by White

Hat Management met AYP in 2011-12, which is actually an improvement from the year before. In addition, while the performance of schools operated by the large for-profit EMOs is especially poor, some full-time virtual schools operated by smaller EMOs or by districts also have relatively weak performance levels.

AYP is structured to benefit more stable schools, and it is not designed to reward growth. Nevertheless, these measures are used to hold all public schools accountable, and they are used to determine whether corrective or punitive action needs to be taken for schools that do not meet their state standards. Given the rapid growth of full-time virtual schools, it will be critical to determine why so comparatively few virtual schools meet AYP standards — especially since they appear to enroll fewer students who make greater demands on schools, like English language learners.

To supplement AYP data, Figure 1.8 details 2011-2012 state ratings of virtual schools' academic performance. (State ratings for individual virtual schools appear in Appendix D). Ratings were available for 228 of the schools in the cohort for this report; the vast majority of those schools (71.9%) were rated academically unacceptable.

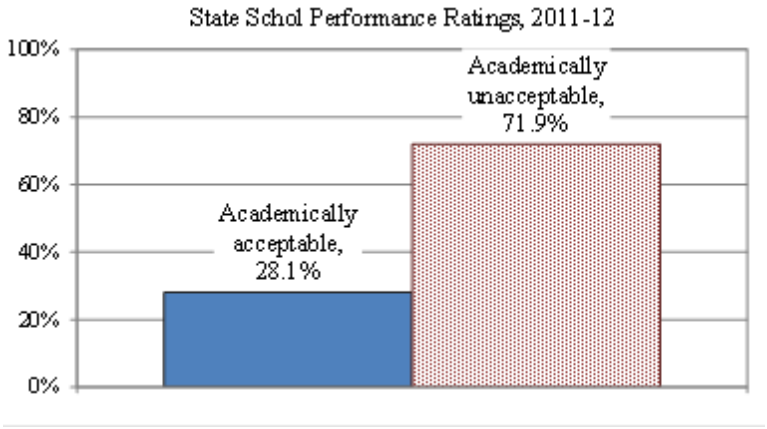

Figure 1.8. State School Performance Ratings of Full-Time Virtual Schools for 2011-12

State rating categories vary considerably. Some assign letter grades, for example, while others specify whether or not the school is in corrective action and at which point in the corrective process. Often, state ratings are based on a variety of measures, with some states including gains for students in the school for a year or more. Of the 228 full-time virtual schools that had been assigned a school rating by state education authorities, only 64 (28.1%) of these schools had ratings that clearly indicated satisfactory or acceptable status.

Graduation Rates

Schools and states have been standardizing how they record and report graduation in recent years. The measure widely used today is "On-Time Graduation Rate," which refers to the percentage of all students who graduate from high school within four years after they started 9th grade. This analysis reported in Figure 1.9 spans 2008-09 to 2011-12. Only 122 virtual schools reported a score related to on-time graduation in 2011-12. This is surprisingly low, although some virtual schools have no graduation rate because they are not high schools, and others are relatively new schools.

Data presented here are based on the total number of students enrolled in the high school grades in each of the schools reporting a graduation rate. As Figure 1.9 illustrates, the on-time graduation rate for the full-time virtual schools was less than half the national average: 37.6% and 79.4%, respectively. This finding is especially poor, but it is in line with the findings on AYP and state school performance ratings. Despite the limited data, this is a significant outcome measure that contributes to an overall picture of school performance.

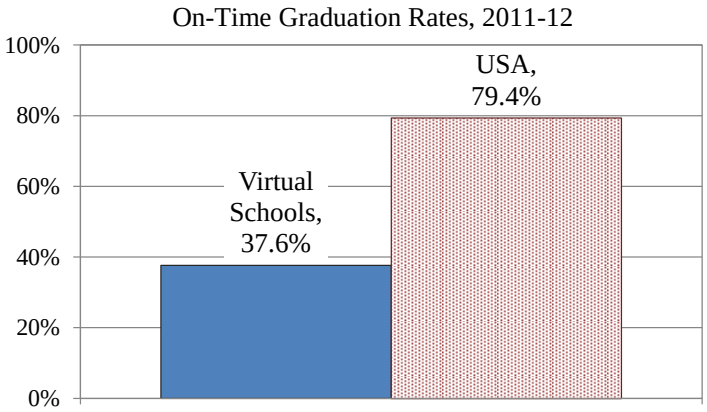

Figure 1.9. Mean Graduation Rates for Virtual Schools Relative to All Public Schools, 2011-12

Discussion

As our inventory of full-time virtual schools shows, this form of schooling is growing rapidly, with growth largely dominated by for-profit EMOs, particularly K12 Inc. Although technology offers exciting possibilities, the consistently negative performance of full-time virtual schools makes it imperative to know more about these schools. The advocates of full-time virtual schools are several years ahead of policymakers and researchers, and new opportunities are being defined and developed largely by for-profit entities accountable to stockholders rather than to any public constituency. Given this picture, continued rapid expansion seems unwise. More research is needed; and to enable such research, state oversight agencies need to require more, and better refined, data.

Recommendations

Given the rapid growth of virtual schools, the populations they serve, and their relatively poor performance on widely used accountability measures, it is recommended that:

- Policymakers should slow or stop growth of virtual schools until the reasons for their relatively poor performance have been identified and addressed.
- Given that some for-profit companies now enroll over 10,000 students, policymakers should impose caps on student enrollment until evidence of satisfactory performance for a provider is available.
- State education agencies and the federal National Center for Education Statistics should clearly identify full-time virtual-schools in their datasets, distinguishing them other instructional models.

- State agencies should ensure that virtual schools fully report data related to the population of students they serve.
- State and federal policymakers should promote efforts to design new outcomes measures appropriate to the unique characteristics of full-time virtual schools.

Notes and References: Section I

76 In the state of Michigan, legislators recently decided to lift the cap on full-time virtual schools, even though the state was in the second year of a pilot study to see whether these schools work and what could be done to ensure that they work better.

77 Barth, P., Hull, J., & St. Andrie, R. (2012). *Searching for the reality of virtual schools*. Alexandria, VA. Center for Public Education, National School Boards Association. Retrieved May 18, 2012, from http://www.centerforpubliceducation.org/Main-Menu/Organizing-a-school/Searching-for-the-reality-of-virtual-schools-at-a-glance/Searching-for-the-reality-of-virtual-schools-full-report.pdf/.

78 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.* Boulder, CO: National Education Policy Center. Retrieved November 21, 2012 from http://nepc.colorado.edu/publication/understanding-improving-virtual/.

79 Watson, J., Murin, A., Vashaw, L., Gemin, B., & Rapp, C. (2011). *Keeping pace with K-12 online learning: A review of state-level policy and practice*. Evergreen, CO: Evergreen Education Group. Retrieved May 6, 2012, from http://kpk12.com/cms/wp-content/uploads/KeepingPace2011.pdf/.

80 Watson, J., Murin, A., Vashaw, L., Gemin, B., & Rapp, C. (2011). *Keeping pace with K-12 online learning: A review of state-level policy and practice*. Evergreen, CO: Evergreen Education Group. Retrieved May 6, 2012, from http://kpk12.com/cms/wp-content/uploads/KeepingPace2011.pdf/.

81 See Figure 1.8 in Miron and Welner (2012):

Miron, G. & Welner, K.G. (2012). Introduction. In G. Miron, K.G. Welner, P.H. Hinchey, & W.J. Mathis (Eds.), *Exploring the school choice universe: Evidence and Recommendations*. Charlotte, NC: Information Age Publishing.

82 In fact, K12 Inc. now enrolls more students than any other private EMO in the country, including those that operate brick-and-mortar charter schools.

Miron, G., Urschel, J.L., Yat Aguilar, M.A, & Dailey, B. (2012*). Profiles of for-profit and nonprofit education management organizations: Thirteenth annual report - 2010-2011*. Boulder, CO: National Education Policy Center. Retrieved May 17, 2012 from http://nepc.colorado.edu/publication/EMO-profiles-10-11/.

83 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.* Boulder, CO: National Education Policy Center. Retrieved [November 21, 2012] from http://nepc.colorado.edu/publication/understanding-improving-virtual/.

84 A relatively small proportion of the students (i.e., 5,766 students) were categorized as mixed or multi-race.

85 See http://ccrc.tc.columbia.edu/publications/adaptability-to-online-learning.html/.

86 The data for Free and Reduced-Price Lunch and ELL are for 2010-11 school year. Because there were so little data on special education available for 2010-11, we relied on data from state sources for the 2011-12 school year. Ninety-two schools had data on special education in 2011-12.

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

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Scaling up virtual school reform presents significant implementation and accountability challenges, as several recent research and technical reports on virtual schools have illustrated.[92] Although there have been some recent legislative efforts to clarify expectations in such areas as accountability and standards, states are struggling to establish accountability mechanisms appropriate for both guiding and auditing virtual schools—even as they allow them to expand. In 2011, for example, Wisconsin, Oregon, Louisiana and Michigan either increased or eliminated enrollment caps for full-time virtual schools. However, none of those states passed legislation strengthening accountability and oversight. A continuing challenge for states will be to reconcile traditional funding mechanisms, governance structures, and accountability demands with the unique organizational models and instructional methods found in virtual schools. Drawing on recent reports and our own research on virtual charter schools,[93] in this section we consider relevant policy issues in the following critical areas:

- Finance and governance
- Instructional program quality
- High quality teachers

For each topic, the following discussion includes a table summarizing critical issues, relevant common assumptions, and related but unanswered key empirical questions. A narrative provides detail on each issue summarized in the tables, and a set of policy recommendations follows.

Finance and Governance

Much of the debate over virtual schools focuses on appropriate funding for them as compared with funding for traditional brick-and-mortar schools. As with other school reform models, such as charter schools and voucher programs, funding formulas for virtual schools must be reconsidered and adjusted to account for the actual costs

associated with this new instructional delivery model. In addition, given the potential of virtual schools to expand access beyond the traditional geographic boundaries associated with brick-and-mortar schools, governance systems must be structured to address the challenges associated with extended attendance boundaries.

Table 2.1 provides an overview of critical concerns for policymakers and others working toward better funding and accountability mechanisms

Table 2.1. Finance and Governance Questions for Virtual Schools

Policy Problem	Assumptions	Empirical Questions
Linking funding to actual costs	Lower staffing and facilities costs outweigh higher costs associated with content acquisition and technology.	What are the costs associated with virtual schools, and their various components? How do the costs change over time? How are costs affected by different student characteristics and contextual factors? What are the implications for weights and adjustments?
Identifying accountability structures	Existing accountability structures provide sufficient oversight of virtual school governance and instructional delivery.	What forms of alternative financial reporting might be useful to policymakers in monitoring the performance of virtual schools?
Delineating enrollment boundaries and funding responsibilities	School choice with open enrollment zones will increase competition and access to better quality schools.	Are local districts or state officials best suited to oversee virtual school operations? Who should ultimately be responsible for funding virtual students? How might state-centered vs. local funding lead to a more stable source of revenue?
Limiting profiteering by EMOs	Diverse educational management and instructional services providers will increase efficiency and effectiveness of virtual instruction.	How much profit are for-profit EMO's earning through the operation of virtual schools? What is the relationship between profits and quality instruction?

Linking Funding to Actual Costs of Virtual Schools

Many proponents who argue that virtual schools are more efficient than traditional schools have focused on the differences in per-pupil revenues for virtual schools compared with those for traditional schools. Recent reports have begun to investigate these claims and reveal that states have yet to develop a sound, systematic basis for funding virtual schools. For example, in Pennsylvania, the State Auditor General has issued two reports that alerted the state legislature to important flaws

in the virtual charter school funding formulas.[94] Specifically, Pennsylvania funds virtual charters at an average of $10,145 per student, nearly $3,500 more than the national average of $6,500 for all full-time virtual charter schools. The auditor general has called for funding caps in line with that national average and for an effort to better link funding to actual costs. These proposals have the potential to reduce funding for Pennsylvania's virtual charters and, in the case of for-profit providers, to decrease the potential for profiteering.

The myriad virtual school funding formulas across states explains the wide range of funding allocations. Some formulas, for example, provide per-pupil allocations resembling those common for students in brick-and-mortar schools, adjusted for such factors as average daily attendance and student needs. Others tie funding to students' successful completion of individual courses. For example, virtual schools in Minnesota receive the same per pupil allocation that traditional schools receive (including federal, state and local revenues). In Florida, Texas and Maine, however, full-time virtual schools are allocated funds based on the number of students completing courses; schools receive funds only after students have successfully completed a course.[95] While there have been policy debates in some states over funding for full-time virtual schools based on cost differences or other policy considerations, as yet, no state has implemented a formula that accounts for actual costs and expenditures of operating virtual schools.

Developing such a formula would involve gathering sound and complete data on costs and expenditures linked to governance, program offerings, types of students served, operational costs and other factors. Costs may vary widely for virtual and 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, compared with those of their brick-and-mortar counterparts. Much of the cost difference is accounted for by two funding categories: teacher salaries and benefits, and facilities and maintenance. The costliest budget item in a traditional school model is teacher compensation, including salaries and benefits; on average, teacher compensation

> *An informed policy process to devise new funding formulas unique to virtual schools will require sophisticated research that provides a more complete and detailed account of the actual costs incurred to start, operate and sustain them.*

accounts for 55% of total expenditures.[96] Facilities and maintenance, in most cases the second highest cost, can amount to nearly 18% of a school's budget.[97] The organizational structure of virtual schools—which employ fewer teachers and maintain fewer facilities—makes their expenses in these categories significantly lower, however. As a result, a lower funding level for these expenses in virtual schools appears justified.

Several reports detail lower costs not only for teacher compensation and facilities, but for other areas as well. For example, a 2012 Thomas B. Fordham Foundation report titled *The Costs of Online Learning* estimates costs of operating full-time virtual and blended learning school models by relying on the input of a panel of 50 virtual education professionals, including entrepreneurs, experts, vendors and school leaders. The report identifies five cost drivers associated with online schooling: (1) teachers and administrators; (2) content acquisition, including the purchase, development, and integration of instructional materials; (3) technology and infrastructure; (4) school operations; and (5) student support, including guidance counselors and special education teachers.[98] The report illustrates that starting and sustaining a virtual school program requires fewer resources for staffing and school operations; instead, costs are heavily weighted toward content (including the acquisition and integration of digital content and instructional materials), technology, and infrastructure. The authors estimate that the average annual cost of full-time virtual schools ranges from $5,100 to $7,700 per pupil and the average annual cost of blended schools ranges from $7,600 to $10,200, compared with an estimated $10,000 average per-pupil cost for all traditional schools in the U.S.[99] Such efforts to identify how various cost drivers affect overall expenditures across different schooling models are an important step toward determining appropriate funding allocations.[100]

Another 2012 report, *Understanding and Improving Full-Time Virtual Schools*, details the funding, operations, and student performance of schools run by K12 Inc., the largest for-profit, virtual school management organization, whose 48 full-time virtual schools in 2010-2011 enrolled more than 65,000 students.[101] The authors explain how K12 Inc. benefits from significant cost advantages because of lesser or no need to fund facilities, transportation and food services. In addition, the corporation spends significantly less than brick-and-mortar schools on teacher and administrator salaries and benefits, student support services, and special education instruction.[102] Even though K12 Inc. reports receiving nearly $2,000 less per pupil (compared with other charter schools in the same states in which K12 Inc. operates),[103] the significant cost advantage of not providing particular services and paying lower salaries is an issue that states must account for if funding is to be meaningfully linked to real costs.

An informed policy process to devise new funding formulas unique to virtual schools will require sophisticated research that provides a more complete and detailed account of the actual costs incurred to start, operate and sustain them. Cost studies could provide crucial information that moves the funding debate away from a focus on relative per-pupil spending to a discussion of real cost differences in traditional and virtual schools as well as real cost differences in serving various student populations.

Identifying Accountability Structures

Determining appropriate funding levels is a first step toward better fiscal management of virtual schools. Additional, and critical, tasks involve devising new accountability

structures to ensure public funds are being spent appropriately and in line with policymakers' goals for the schools. To this end, alternative financial reporting to provide a better picture of spending is needed. For example, to ensure that resources provided are actually used to meet the needs of students, policymakers might require virtual schools to report expenditures linked to direct benefits to students (like technology adoption, learning materials, paraprofessional services, and third-party curriculum). Systems will also be necessary to track records such as attendance logs and student transcripts, and to ensure that accountability is in place for defining, logging and evaluating instructional time. A funding formula that recognizes the costs associated with tracking and meeting these indicators may begin to more accurately identify necessary resource levels.

Of course, to determine what information they need, policymakers will first have to think through and be explicit about the specific goals they hope to achieve by implementing and expanding virtual schools.

Delineating Enrollment Boundaries and Funding Responsibilities

As students move across district and county lines, their resident districts struggle to monitor which virtual schools are providing substantive education services to which students. Audits are necessary not only to determine where students are actually being schooled, but also to ensure that resident districts are forwarding appropriate local and state per-pupil allocations to virtual schools their students are attending. A policy that delineates geographic boundaries with manageable enrollment zones can simplify the oversight challenges presented by borderless enrollment zones.[104] In addition, the large influx of privately homeschooled students into virtual schools (and others not previously enrolled in public schools) has resulted in an unexpected need for additional state and local funding, as virtual schools assume the instructional costs formerly borne primarily by parents.[105] Many school districts are challenged to reallocate budgets to fund students not previously on the public school rolls.

In response to these issues, policymakers should consider approving and funding virtual schools at the state level, and drawing primarily on state-level revenues to fund them. A state-centered funding system would provide a more stable source of revenue for virtual schools, offer fiscal relief for local districts, relieve schools from having to solicit the larger share of their per-pupil payments from their students' resident districts, and relieve local districts of budget shortfalls caused by enrollment spikes of virtual students. In addition, a state-centered funding system would benefit from economies of scale in such areas as content and technology acquisition, allowing for a uniform funding formula as well as more efficient use of revenues.

A prominent example of such an effort is the Florida Virtual School (FLVS), a state-level virtual school serving nearly 97,000 students. While the vast majority of these students enroll in one or a few online courses while enrolled in a brick-and-mortar school, almost 2,000 are enrolled full-time in the state virtual school, with a full-time student funding equivalent of $4,840 per student (compared with the $6,999 average state-level funding for a student attending a brick-and-mortar school in Florida).[106] FLVS funding is

performance-based and paid only after a student has successfully completed a course. In addition, teacher training and development, content and technology acquisition, and accountability of program quality are the responsibility of FLVS. While the FLVS program effectiveness has yet to be fully and externally validated, reported completion rates are mixed. Only 66% of students who enroll in a course complete it, and of those, 81% pass.[107]

Eliminating Profiteering by Education Management Organizations

A growing number of for-profit education management organizations (EMO) that provide virtual school products and services—including software and curriculum, instructional delivery, school management, and governance—have secured local and state contracts. Together, the virtual schools that have contracts with for-profit EMOs serve more than 68% of full-time virtual school students.[108] As noted earlier, the largest of the for-profit EMOs is K12 Inc., which operates 58 virtual schools and serves approximately 77,000 full-time students—about one-third of the estimated 200,000 full-time virtual school students in the U.S, as estimated in Section I of this report. K12's 2012 operating profit was $29 million and total revenue exceeded $708 million, amounting to a 125% increase in operating profit and more than 200% increase in revenue, compared with 2008 figures.[109] Significant increases in revenue over the last four years are linked to the sharp increase in K12 Inc. enrollment, which has more than tripled from some 25,000 students it served in 2007.[110] Enrollment has increased despite the fact that during that same period, some of K12's largest schools in Ohio, Colorado and Pennsylvania posted student "churn" rates as high as 51%, meaning that fewer than half of students who enrolled completed the full academic year.[111]

Such statistics illustrate the need for greater accountability and have prompted some states to begin proposing limits on for-profit EMO operations. For example, in Pennsylvania, the Auditor General has recommended placing limits on contracts with EMOs and fees for administrative and other services.[112] In Pennsylvania, 42% of virtual schools paid management companies in 2010-11, with one school paying approximately $1,300 per student in management fees.[113] An earlier report by the Pennsylvania Auditor General also found many virtual schools with unreserved budget balances not designated for education purposes. In some cases, these funds amounted to twice the average balance held by school districts, and "one cyber charter school reported unreserved-undesignated general fund balances exceeding 100% of their total annual expenditures."[114]

Clearly, additional research is needed to identify funding and governance practices that may facilitate profiteering by service providers and to identify effective preventive measures. New evidence will inform leaders on how to develop ways to ensure that for-profit virtual schools do not prioritize profit over student performance.

Recommendations

Given the information and experiences detailed above, 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 sustain such structures, and provide adequate support for them.
- 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.

Instructional Program Quality

Accountability procedures for virtual schools must address not only their unique organizational models but also their instructional methods. Quality of content, quality and quantity of instruction, and quality of student achievement are all important aspects of program quality.[115] Table 2.2 outlines issues, assumptions and questions relevant to instructional quality.

Table 2.2. Instructional Program Quality Questions for Virtual Schools

Policy Problem	Assumptions	Empirical Questions
Requiring high-quality curricula	Course content offered through online curricula is an effective means for meeting individualized education goals.	How is the quality of course content best evaluated?
Ensuring both quality and quantity of instruction	Instructional seat time is not an accurate measure of learning.	What is the best method of determining learning? What learning-related factors are different in an online environment? Should outcomes beyond subject-matter mastery be assessed?
Monitoring student achievement	Students in virtual schools perform equal to or better than traditional peers and existing empirical work has adequately measured student achievement. Modest gains can be taken to scale.	As some states move to student choice at the course level, what do they need to implement quality assurance from multiple providers? How does course content affect student achievement?

Evaluating the Quality of Curricula

While it is commonly assumed that virtual instruction provides more efficient, highly individualized instruction, the empirical question remains: how can an authorizer effectively evaluate the

quality of course content and monitor learning given the variability of digital materials and formats? The nascent market is flooded with content developed by various providers, ranging from large for-profit organizations to local districts, and in various formats, ranging from individual courses to full grade-level curricula. Authorizers or parents are hard-pressed to ensure quality content in the current, highly decentralized environment.

To be satisfactory to most buyers, virtual curricula must align with applicable state and district standards, and policymakers face the major challenge of identifying benchmarks for determining whether a particular virtual program meets both local and state level accountability demands. They also must find ways to monitor program content in an environment where digital content changes frequently.

Policymakers may find the *iNACOL National Standards of Quality for Online Courses*[116] a useful evaluative tool for assessing quality course material. It represents a good starting point for assessing internally developed and externally acquired course content. Like curricula in traditional schools, online curricula must be aligned with a designated set of standards to ensure that students' individualized online learning experiences provide them with all of the information and skills policymakers deem essential.

Ensuring Quality and Quantity of Instruction

Other elements of instructional programs that affect their quality include how much meaningful interaction students have with teachers and how much time students spend in learning activities. A virtual environment changes the dynamic of the teacher-student relationship and the definition of student learning. In some cases, the teacher becomes merely a distant facilitator, with instruction provided primarily by software and interaction provided primarily by parents or other non-professionals. Reductions in face-to-face or other forms of communication between students and certified teachers weaken monitoring of program quality and of student learning. Teacher-student contact helps ensure that instruction provided at a particular moment is actually appropriate for a particular student, allows for adjustments in the case of unanticipated difficulties or needs, and provides opportunities for close monitoring of student progress. Therefore, policymakers must carefully consider the role of professional teachers in virtual instructional programs.

An additional challenge in assessing program quality is determining how student learning will be assessed. In recent years, many states have been moving away from "seat time" as an appropriate indicator, recognizing that simply being at a designated site for a particular number of hours does not guarantee student learning. For example, the Colorado Department of Education has launched an initiative to "focus on expanding learning opportunities for each student by looking beyond the typical school building, day, and calendar,"[117] thus allowing students to progress at their own pace through increased online and blended courses. However, just as sitting in a classroom for a certain number of hours cannot guarantee learning, neither can sitting in front of a computer or engaging with a hand-held device for a specified time. Alternative assessments are necessary. Increasingly,

leaders in education have been working to shift evidence of mastery from a simple counting of hours spent in a learning environment to comprehensive evaluation systems. Such systems generally include summative assessments supported by formative assessments in the classroom, involving alternative demonstrations of mastery such as projects, papers and portfolios.

Attention to instructional quality and student performance is becoming more common in research and policy on virtual schools. For example, the Evergreen Education Group, a consulting and support organization for schools and districts implementing virtual and blended models, advises that learning must "transcend time- and place-related requirements and focus, instead, on successful student achievement."[118] In some cases, funding policies for online schools promote a shift away from traditional time measures, although the path has not always been smooth. For example, online schools in California have been hampered by the state's reliance on funding policies based on bodies in seats, or average daily attendance (ADA). Traditional school ADA is calculated based on the number of days of attendance of all students divided by the number of school days in a reporting period. To comply with the funding formula yet promote virtual learning, online schools in California have been funded as independent study, in which ADA funding is generated based on the teacher's determination of the time value of student work. In contrast to ADA, time value funding is based on student work; a certificated teacher assesses the quality of the work based on assignment objectives and then calculates the time required for the student to produce the work.[119] The focus here shifts seat time or attendance to the amount and quality of work that a student has produced, yet this is still a somewhat convoluted solution as funding remains based on ADA. State legislation passed in Fall 2012 (AB 644) began to simplify California's funding issues. It changed the state's funding model by eliminating the need to categorize online learning as independent study and instead allowing schools to claim ADA for synchronous online courses (in which students and teachers are online at the same time).[120]

In January 2013, Governor Jerry Brown further advanced virtual learning into California's educational mainstream by pushing to modify funding for asynchronous online courses (in which students and teachers visit online courses at their own convenience). Under Brown's current proposal, funding would be based on student proficiency, not ADA. At the end of the learning period, the teacher would determine if the student met the predefined learning objectives. If the objectives were met, the school could claim ADA; if not, the state would not approve funding.[121] Resulting accountability procedures would thus be better aligned with student learning in a particular online program.

Monitoring Quality of Student Achievement

Monitoring student achievement in virtual schools is a primary consideration. Advocates and for-profit companies often claim that students in virtual schools perform equal to or better than peers in traditional schools.[122] However, recent school-level achievement data from California indicated that virtual charters have "much lower adjusted test scores than

either other charter schools or conventional public schools."[123] In Pennsylvania, Stanford University researchers used a matched pair sampling methodology and found that students in virtual charters made smaller learning gains over time compared with both their brick-and-mortar charter and traditional school counterparts.[124] In addition, the analysis of school performance in Section I illustrates that metrics commonly used to assess school performance show virtual schools to be behind, rather than ahead, of other types of schools in terms of facilitating student learning—especially for specific demographic groups.

A meta-analysis of the most recent and robust research on online learning sponsored by the U.S. Department of Education illustrates how little is known to date and confirms a lack of evidence that virtual education is producing improved achievement.[125] As will be discussed in more detail in Section III, the authors of this analysis do find some indication of modest positive effects of online learning; however, they strongly caution that the measured advantages may derive more from factors like the amount of time on task rather than from the online delivery mode.[126] How various online formats and programs may affect achievement is an especially important consideration given state and federal policies imposing increasing demands for demonstrated student achievement.

State legislation allowing students greater freedom to choose single courses from multiple providers, or to remain enrolled at a traditional school while supplementing coursework through online providers, presents another challenge for monitoring student achievement. Research questions that arise include how to implement quality assurance from multiple providers as well as how to determine the impact of course quality on student outcomes.[127] Policymakers, school authorizers, and school leaders face the daunting task of developing a comprehensive, longitudinal view of student learning and growth that incorporates multiple methods of assessment aligned with educational objectives and that provides timely, meaningful feedback to all stakeholders. Acknowledging this need, iNACOL policy recommendations advocate that policymakers "fundamentally rethink the concept of assessment—not as a single point of time—but as 'systems of assignments' throughout a students' learning process"[128] including formative assessments for feedback, summative assessments to demonstrate achievement, and "validating assessments to protect high levels of rigor."[129] Further, school authorizers must adhere to rigorous quality standards and close programs that fail to advance student achievement.

Recommendations

Given the information and experiences detailed above, it is recommended that policymakers:

- Require high quality curricula, aligned with applicable state and district standards, and monitor changes to digital content.

- Develop a comprehensive system of summative and formative assessments of student achievement, shifting assessment from a focus on time- and place-related requirements to a focus on student mastery of curricular objectives.
- Assess the contributions of various providers to student achievement, and close virtual schools and programs that do not contribute to student growth.

High Quality Teachers

Professional teachers remain critical in online education. The common assumption that effective teachers will wholeheartedly embrace digital tools and be motivated to teach in a one-dimensional virtual environment must be carefully examined. In addition, lessons from research on effective teaching indicate that it requires support from a school's environment.[130] Elements of the environment that support teachers and promote effective teaching include strong leadership, peers, professional development, books, materials, and an abundance of other resources.[131] Policymakers must ensure that such support, or other types of support necessary in a digital environment, is available to professionals teaching online. Effective recruitment, professional development, assessment, and retention of high quality teachers are all critical components of a strong virtual environment in which both teachers and students thrive.[132]

Table 2.3 outlines challenges, assumptions and questions in this area.

Table 2.3. Teacher Quality Questions for Virtual Schools

Policy Problem	Assumptions	Empirical Questions
Recruiting and training qualified teachers	Instructional training and professional support tailored to online instruction will help recruit and retain teachers. Effective teaching in a traditional environment easily translates to an online environment. Teacher preparation programs and district professional development programs will re-tool to support online instruction demands.	Can sufficient numbers of qualified online teachers be recruited and trained to ensure the ability of virtual education to offer new opportunities to rural or underserved populations? Which professional skills and certifications for online teachers are the same as for traditional teachers? Which are different? What professional development is relevant for online teachers?
Evaluating and retaining effective teachers	Evaluation of online teachers can mirror that of teachers in traditional settings. Online teachers can support a large roster of students.	How well do evaluation rubrics for traditional settings translate to an online environment? How much direct attention and time is necessary for a student to receive adequate instructional support? What are the implications for teaching load?

Recruiting and Training Qualified Teachers

The shift from a traditional classroom to a virtual setting requires sufficient numbers of new and experienced teachers who are motivated and prepared to engage in online instruction. One of the recognized benefits of virtual schools is the opportunity for rural and other underserved and at-risk students to gain access to highly qualified teachers. Through technology that can scale and customize education, online instruction has the potential to be a "great equalizer"[133] in extending access to rigorous and high quality schooling to every student across the country. For example, at the university level but available to students of any age, Udacity was founded following the offering of a free, online artificial intelligence course that attracted 160,000 students from 190 countries. At the higher education level, Udacity claims it is "democratizing education."[134] However, realizing equal opportunity through online instruction requires recruiting and supporting a cadre of qualified teachers motivated to teach in an online environment. Although some proponents claim that effective teaching translates easily into any environment, this statement is largely a myth.[135] While some evidence exists on the relationship between teacher qualifications and their effectiveness in a traditional setting, research provides little information on the attributes linked with teacher effectiveness in a virtual setting. Factors related to teacher motivation, the ability to instruct largely through written communication, and tolerance of working at a computer for much of the day create a unique set of circumstances that have implications for both the type of individual attracted to online teaching and the characteristics that make teachers effective online.[136] Research is needed to identify characteristics of effective online teachers and to determine mechanisms to recruit and support teachers who will thrive in an online environment.

Teacher education programs are one clear starting point for recruiting and training qualified and effective online teachers. However, the National Association of State Directors of Teacher Education and Certification, a Washington-based organization whose members are responsible in their respective states for preparation and licensure of educators, began discussing certification for online instructors only in Fall 2012.[137] Only a few states, including Wisconsin, mandate separate requirements for teachers working in digital environments, following the lead of Georgia, which in 2006 was the first state to offer optional certification for online teaching.[138]

As is true in traditional schools, ongoing professional development is essential for maintaining a high level of skill among online teachers, particularly because technological devices and software change so rapidly. Currently, some states require online schools to offer professional development in teaching strategies for online instructors.[139] However, many virtual schools are themselves leading efforts to define critical technical skills and pedagogies for online teachers and providing professional development in those areas.

Teacher mentor and induction programs are also promising support mechanisms. Recent research on traditional schools in New York City reported that strong teacher mentors and induction programs positively influence the performance and retention of new teachers.[140] In fact, a quality induction program is a proven avenue toward increasing teacher mastery and retaining quality teachers, which promotes student academic achievement and

improves the overall educational school quality. Additional research is required to determine the impact of these programs in a virtual environment.

Given the lack of consistency regarding teacher preparation and support that would assure teachers' success in online environments, researchers, education leaders and policymakers must focus attention on these important issues. Essentially, governance at the state level must define new certification training and relevant teacher licensure requirements,[141] education schools must incorporate teaching pedagogy in a virtual environment, and districts and schools must continually improve online teaching models through comprehensive professional development.

Evaluating and Retaining Effective Teachers

Teacher evaluation and retention are both critical to the development and success of the nascent virtual schooling industry. Ensuring that online teachers are effective requires appropriate assessment; retaining teachers identified as effective requires that they be provided with a desirable teaching environment.

Effective teacher evaluation is currently an important topic in both online and traditional classrooms. School leaders and policymakers must consider how well evaluation rubrics for traditional settings translate to a virtual environment. Unfortunately, few large-scale studies have attempted to define effective online pedagogy and to identify which practices seem most effective in a virtual setting. Still less research has attempted to show which practices might be most effective for which students in an online environment. As researchers begin to address this gap in the knowledge base, school leaders and policymakers should use the emerging literature to develop evaluation mechanisms aligned with what is known about teacher skills and attributes essential in an online environment. This will require an adaptable and comprehensive evaluation rubric specifically designed to support and assess effective teacher performance in variable online formats.

Identifying effective teachers is one thing; retaining them in online teaching positions is another. Research has repeatedly demonstrated that a key factor in retaining teachers is their ability to achieve the oft-cited goal of impacting students' lives.[142] However, some online schools demand that a teacher in an online environment support a large roster of students. For example, in 2011, an online school in Nevada reported a ratio of 60:1 compared with the school's district average of 18:1.[143] At this ratio, education leaders must examine the extent to which a teacher can truly provide the attention and time necessary for a student to receive adequate instructional support, and, thus, the extent to which that teacher can impact students' lives. To address similar ratio issues, the California legislation cited above (AB 644) mandates that for courses in which teachers and students participate at the same time, the ratio of teachers to students cannot exceed that of other programs in the surrounding district, unless negotiated in a collective bargaining agreement.[144] Policymakers in other states ought to develop guidelines to define an appropriate student-teacher ratio, taking into account variables such as the delivery model

(e.g., full-time online instruction, blended models and homeschooling), the subject area, grade level and ability of students.

In addition, the preferences of parents and students must also be considered. Effective schooling is about more than simply the delivery of instruction and the quality of teaching. It includes the social and cooperative elements of student-teacher interaction as well as peer-interaction, synchronously as well as asynchronously, which in part activate effective teaching.[145] The extent to which virtual environments will be able to replicate these important virtues of effective classroom schooling is not known. This, too, requires careful ongoing evaluation to ensure that program design provides teachers with support and time for such activities.

Recommendations

Given the information and experiences detailed above, it is recommended that policymakers and educational leaders:

- Define new certification training and relevant teacher licensure requirements[146] and continually improve online teaching models through comprehensive professional development.
- Address retention issues by developing guidelines for appropriate student-teacher ratios.
- Work with emerging research to create effective and comprehensive teacher evaluation rubrics.

Notes and References: Section II

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93 Huerta, L. A., d'Entremont, C. & González, M. F. (2009). Perspective on cyber and homeschool charters. In M. Berends, M. Springer, D. Ballou and H. Walberg (eds.), *Handbook of Research on School Choice* (533-550). Nashville: National Center on School Choice. Vanderbilt University, and New York: Routledge;

Huerta, L. A., d'Entremont, C., &. González, M. F. (2006, September). Cyber charter schools: Can accountability keep pace with innovation*? Phi Delta Kappan, 88* (1), 23-30.

94 Wagner, J. (2010, September). *Special report: The Commonwealth should revise its charter and cyber charter school funding mechanisms*. Harrisburg, PA: Bureau of School Audits, Pennsylvania Department of the Auditor General; retrieved September 21, 2012, from http://www.auditorgen.state.pa.us/reports/performance/special/speCharterFundingReport100510.pdf/;

Wagner, J. (2011, June). *Special report: Charter and cyber charter education funding reform should save taxpayers $365 million annually*. Harrisburg, PA: Bureau of School Audits, Pennsylvania Department of the Auditor General; retrieved September 21, 2012, from http://www.auditorgen.state.pa.us/Department/Press/CyberCharterSpecialReport201206.pdf/.

For a wider discussion on funding for virtual schools compared with traditional schools, see also:

Barth, P., Hull, J., & St. Andrie, R. (2012). *Searching for the reality of virtual schools.* Alexandria, VA. Center for Public Education, National School Boards Association. Retrieved May 18, 2012, from http://www.centerforpubliceducation.org/Main-Menu/Organizing-a-school/Searching-for-the-reality-of-virtual-schools-at-a-glance/Searching-for-the-reality-of-virtual-schools-full-report.pdf/;

Glass, G. V & Welner, K. G. (2011*). Online K-12 Schooling in the U.S.: Uncertain Private Ventures in Need of Public Regulation*. Boulder, CO: National Education Policy Center. Retrieved August 12, 2012, from http://nepc.colorado.edu/publication/online-k-12-schooling/.

95 Watson, J., Murin, A., Vashaw, L., Gemin, B., & Rapp, C. (2011). *Keeping pace with K-12 online learning: A review of state-level policy and practice*. Evergreen, CO: Evergreen Education Group. Retrieved October 11, 2012, from http://kpk12.com/cms/wp-content/uploads/KeepingPace2011.pdf/.

96 National Center for Education Statistics. (2010). *Revenues and expenditures for public elementary and secondary education: School year 2009-10*. Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

97 National Center for Education Statistics. (2010). *Revenues and expenditures for public elementary and secondary education: School year 2009-10*. Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

98 Battaglino, T.B., Haldeman, M., & Laurans, E. (2012). *The Costs of Online Learning*. Washington, DC: Thomas B. Fordham Institute. Retrieved October 18, 2012, from http://www.edexcellence.net/publications/the-costs-of-online-learning.html/.

99 Battaglino, T.B., Haldeman, M., & Laurans, E. (2012). *The Costs of Online Learning*. Washington, DC: Thomas B. Fordham Institute. Retrieved October 18, 2012, from http://www.edexcellence.net/publications/the-costs-of-online-learning.html/.

The estimated average cost of full-time and blended virtual school models relies on information "gathered from available public documents and conversations with experts and vendors within the field" (p. 5).

100 However, the findings in the report are compromised by methodological limitations. A review of the report by Rice (2012) outlines how data for the cost comparisons was insufficient to account for all expenditures in the school models that were being compared, the student populations being served, and the existing technology resources that schools may already be utilizing, in addition to several other limitations. See:

Rice, J.K. (2012). *Review of "The Costs of Online Learning."* Boulder, CO: National Education Policy Center. Retrieved September 12, 2012, from http://nepc.colorado.edu/thinktank/review-cost-of-online/.

101 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.* Boulder, CO: National Education Policy Center. Retrieved September 22, 2012, from http://nepc.colorado.edu/publication/understanding-improving-virtual/.

102 The authors compared revenues and expenditures of a subset of K12 Inc. schools with three groups: 1) charter schools in states where K12 Inc. operates schools; 2) all public schools in states where K12 Inc. operates schools; and 3) the national average for all public schools in the United States.

103 The authors compared revenues and expenditures of a subset of K12 Inc. schools with three groups: 1) charter schools in states where K12 Inc. operates schools; 2) all public schools in states where K12 Inc. operates schools; and 3) the national average for all public schools in the United States.

104 For example, in California SB434 (1999) limited cyber charter school enrollment (described as non-classroom-based by the California Education Code) to students who reside in the county where the charter is authorized or a county with contiguous borders.

105 For example, K12 Inc., the largest virtual school provider, reported that 31% of its students were previously not enrolled in public schools (13.6% homeschool; 11.7% other/not in school; 6% private school). See

K12 Inc. (2013). 2013 K12 Academic Report, Retrieved February 8, 2013, from http://www.k12.com/sites/default/files/pdf/2013-K12-Academic-Report-Feb6-2013.pdf/.

106 Davis, Michelle R. (2012, March 15). Examining the Florida virtual school: The largest state-sponsored online school is held up as a model, but some are questioning how well it works. *Education Week*. Retrieved, September 12, 2012, from http://www.edweek.org/ew/articles/2012/03/15/25florida.h31.html (subscription required).

See also, Florida House of Representatives (2010). Florida virtual school: Education fact sheet 2010-11. Retrieved, October 15 2012, from http://www.myfloridahouse.gov/FileStores/Web/HouseContent/Approved/Web%20Site/education_fact_sheets/2011/documents/2010-11%20Florida%20Virtual%20School.3.pdf/.

107 Catalanello, R. and Marlene Sokol, M. (2012, January 8). Success of Florida virtual schools is difficult to measure. *Tampa Bay Times*, Retrieved November 12, 2012, from http://www.tampabay.com/news/education/k12/article1209497.ece/.

108 Glass, G. V & Welner, K. G. (2011). *Online K-12 Schooling in the U.S.: Uncertain Private Ventures in Need of Public Regulation*. Boulder, CO: National Education Policy Center. Retrieved August 12, 2012, from http://nepc.colorado.edu/publication/online-k-12-schooling/.

See also:
Queen, B. & Lewis, L. (2011). *Distance education courses for public elementary and secondary school students: 2009–10* (NCES 2012-008). Washington, DC: National Center for Education Statistics, U.S. Department of Education.

109 K12 Inc. 2012 Annual Report 10-K, Retrieved February 30, 2013, from http://investors.k12.com/phoenix.zhtml?c=214389&p=irol-reportsannual/.

110 K12 Inc. 2008 Annual Report 10-K, Retrieved January 30, 2013, from http://investors.k12.com/phoenix.zhtml?c=214389&p=irol-reportsannual/.

111 For example, in the 2010-11 academic year, Ohio Virtual Academy enrolled 18,743 students, and 9,593 withdrew (51% churn); in the 2009-10 academic year, Agora Cyber School in Pennsylvania enrolled 7,578 students, and 2,688 withdrew (35% churn); in the 2010-11 academic year, Colorado Virtual Academy enrolled 6,449 students, and 2,330 withdrew (36% churn).

See David Hoppaugh vs. K12 Inc. (2012). Amended Class Action Complaint, Civ. A. No. 1:12-cv-00103-CMH-IDD, United States District Court, Eastern District of Virginia, Alexandria Division.

112 Wagner, J. (2011, June). *Special report: Charter and cyber charter education funding reform should save taxpayers $365 million annually*. Harrisburg, PA: Bureau of School Audits, Pennsylvania Department of the Auditor General; retrieved September 21, 2012, from http://www.auditorgen.state.pa.us/Department/Press/CyberCharterSpecialReport201206.pdf/.

113 Wagner, J. (2011, June). *Special report: Charter and cyber charter education funding reform should save taxpayers $365 million annually*. Harrisburg, PA: Bureau of School Audits, Pennsylvania Department of the Auditor General; retrieved September 21, 2012, from http://www.auditorgen.state.pa.us/Department/Press/CyberCharterSpecialReport201206.pdf/.

For a discussion on how the actual costs of services provided by EMOs are difficult to distil in non-transparent virtual school budgets, compared with state-operated virtual schools, see also:

Barbour, M. K. (2012). Virtual schools are more cost-effective compared to traditional, brick-and-mortar schools? In K. P. Brady (Ed.), *Technology in Schools: Debating Issues in American Education*. Thousand Oaks, CA: Sage.

114 Wagner, J. (2010, September). *Special report: The Commonwealth should revise its charter and cyber charter school funding mechanisms*. Harrisburg, PA: Bureau of School Audits, Pennsylvania Department of the Auditor General; retrieved September 21, 2012, from http://www.auditorgen.state.pa.us/reports/performance/special/speCharterFundingReport100510.pdf/.

115 Teacher quality is obviously also a key element of program quality; we consider that critical element in the next section of our report.

116 The International Association for K-12 Online Learning (iNACOL) advocates for access to online courses. In addition to researching and disseminating information regarding online learning, the organization is active in policy advocacy to promote virtual schools.

Bakken, B. & Bridges, B. (2011). *National standards for quality online courses*. International Association for K-12 Online Learning. Retrieved April 30, 2013, from http://www.inacol.org/resources/publications/national-quality-standards/.

117 Colorado Department of Education. (2012). http://www.cde.state.co.us/choice/index.asp

118 The Evergreen Education Group provides consulting and support for schools, districts, nonprofit organizations, government agencies and companies involved in education reform through online learning.

Watson, J., & Gemin, B. (2009). *Funding and policy frameworks for online learning*. Evergreen, CO: Evergreen Education Group. Retrieved October 11, 2012, from http://www.inacol.org/research/promisingpractices/NACOL_PP-FundPolicy-lr.pdf/.

119 SB 434 (1999) changed apportionment credit from the traditional "seat time attendance" to apportionment based on time value of student work. Time value calculations are based on three factors: (a) weighing the objectives of an assignment given by a certified teacher, (b) the work submitted by students by specified due date, (c) and the judgment of a teacher who evaluates and calculates the time value of completed work. Together, these factors make up an apportionment credit that is based on student work rather than physical attendance. See

Huerta, L. A., González, M. F. & d'Entremont, C. (2006). Cyber and home school charter schools: Adopting policy to new forms of public schooling. *Peabody Journal of Education, 81*(1), 103-139;

Huerta, L. A., d'Entremont, C. & González, M. F. (2009). Perspective on cyber and homeschool charters. In M. Berends, M. Springer, D. Ballou and H. Walberg (eds.), *Handbook of Research on School Choice* (533-550). Nashville: National Center on School Choice. Vanderbilt University, and New York: Routledge.

120 Legislative Council, State of California (2012). AB 644 bill analysis. Retrieved April 30, 2013, from http://www.leginfo.ca.gov/pub/11-12/bill/asm/ab_0601-0650/ab_644_cfa_20120626_093301_sen_comm.html/.

121 Chorneau, T. SI&A Cabinet Report, (2013). Brown's budget pushes frontier of online learning. http://www.siacabinetreport.com/articles/viewarticle.aspx?article=2663/.

122 For example, see K12, Inc.'s Best Virtual School Solution for Students, page 5: "As evidence of the benefit of our holistic approach, our fully managed K12 partner schools generally test above state averages on standardized achievement tests."

Retrieved April 30, 2013, from http://www.k12.com/sites/default/files/pdf/K12-Inc-Best-Virtual-School-Solution-2010.pdf/.

123 Zimmer, R., Buddin, R, Chau, D., Gill, B., Guarino, C., Hamilton, L., Krop, C., McCaffrey, D., Sandler, M., & Brewer, D. (2003). *Charter school operation and performance: Evidence from California.* Santa Monica: RAND.

The researchers also found that virtual students come from more mobile families (higher socioeconomic status, including higher parent education levels and much lower rates of free and reduced-price lunch) when compared with their traditional charter school counterparts (Buddin & Zimmer, 2005). In another recent study that analyzed whether California charters meet the achievement growth targets set by the California Academic Performance Index, nonclassroom-based charters were significantly outperformed by both classroom-based charters and traditional public schools. See:

EdSource (2005, May). *How are California's charter schools performing?* Palo Alto, CA: Author

124 CREDO. (2011). *Charter school performance in Pennsylvania.* Palo Alto, CA: Center for Research on Education Outcomes (CREDO), Stanford University.

125 U.S. Department of Education (2010). Evaluation of evidence-based practices in online learning, Washington, DC: U.S. Department of Education Office of Planning, Evaluation and Policy Development.

126 More importantly, the small statistically significant positive effects of online instruction are limited to studies that measured its effects for adult learners. Specifically, only 7 of the 50 studies included in the meta-analysis examined a K-12 learning environment, and the weighted mean of the modest positive effects of these seven studies were not statistically significant. Lastly, the authors of the meta-analysis warn that the number of rigorous studies on K-12 online learning is still too small to warrant confidence about its effects.

127 Watson, J., Murin, A., Vashaw, L., Gemin, B., & Rapp, C. (2012). *Keeping pace with k-12 online & blended learning: An annual review of policy and practice*. Retrieved October 11, 2012, from http://kpk12.com/cms/wp-content/uploads/KeepingPace2012.pdf/.

128 International Association for K-12 Online Learning, (n.d.). Online learning: Top 5 federal policy issues brief. Retrieved April 30, 2013, from https://www.inacol.org/cms/wp-content/uploads/2013/04/iNACOL-Federal-Frameworks.pdf/.

129 International Association for K-12 Online Learning, (n.d.). Online learning: Top 5 federal policy issues brief. Retrieved April 30, 2013, from https://www.inacol.org/cms/wp-content/uploads/2013/04/iNACOL-Federal-Frameworks.pdf/.

130 Rice, J. K. (2003). *Teacher quality: Understanding the effectiveness of teacher attributes.* Washington, DC: Economic Policy Institute.

131 See the collection of essays in *Voices in Urban Education* (2010, Spring). Collective practice, quality teaching. Providence , RI: Annenberg Institute for School Reform, Brown University.

132 Critics of EMO-managed virtual schools have voiced concerns regarding wages paid to online teachers. However, salary issues are beyond the scope of this report.

133 Foundation for Excellence in Education. (2010). *Digital learning now!*

134 Udacity: About us. (2013). Retrieved April 30, 2013, from https://www.udacity.com/us

135 Watson, J., Murin, A., Vashaw, L., Gemin, B., & Rapp, C. (2012). *Keeping pace with k-12 online & blended learning: An annual review of policy and practice*. Retrieved October 11, 2012, from http://kpk12.com/cms/wp-content/uploads/KeepingPace2012.pdf/.

136 Goldhaber, D. & Brewer, D. (1997). Why don't schools and teachers seem to matter? Assessing the impact of unobservables on educational productivity. *Journal of Human Resources, 32*(3), 505-523.

137 Flanigan, R. L. (2012). Virtual ed. addresses teacher-certification questions. *Education Week, 32*(02), 210-211. Retrieved April 30, 2013, from http://www.edweek.org/ew/articles/2012/08/29/02el-certified.h32.html/ (subscription required).

138 Flanigan, R. L. (2012). Virtual ed. addresses teacher-certification questions. *Education Week, 32*(02), 210-211. Retrieved April 30, 2013, from http://www.edweek.org/ew/articles/2012/08/29/02el-certified.h32.html/ (subscription required).

139 Watson, J., & Gemin, B. (2009). *Funding and policy frameworks for online learning*. Evergreen, CO: Evergreen Education Group. Retrieved October 11, 2012, from http://www.inacol.org/research/promisingpractices/NACOL_PP-FundPolicy-lr.pdf/.

140 Rockoff, J.E. (2008) Does mentoring reduce turnover and improve skills of new employees? Evidence from teachers in New York City, NBER Working Paper 13868. Retrieved January 20, 2012 from: http://www.nber.org/papers/w13868.pdf

141 Watson, J., & Gemin, B. (2009). *Funding and policy frameworks for online learning*. Evergreen, CO: Evergreen Education Group. Retrieved October 11, 2012, from http://www.inacol.org/research/promisingpractices/NACOL_PP-FundPolicy-lr.pdf/.

142 See for example:

Ing (2010, April 28). A lesson learned: ING survey finds teachers have a profound and lasting impact on our lives, yet are vastly under-appreciated (press release). Atlanta, GA: Author. Retrieved April 30, 2013, from http://ing.us/about-ing/newsroom/press-releases/lesson-learned-ing-survey-finds-teachers-have-profound-and-lasting/;

Richardson, P. W. & Watt, H. W. G. (2006). Who chooses teaching and why? Profiling characteristics and motivations across three Australian universities. *Asia-Pacific Journal of Teacher Education, 34*(1), 27-56. Retrieved April 30, 2013, from http://users.monash.edu.au/~hwatt/articles/Richardson%26Watt_APJTE2006.pdf/.

143 Nevada Department of Education, (2011). *Nevada Virtual Academy 2010-2011 School Accountability Summary Report*. Retrieved April 30, 2013, from http://www.nevadareportcard.com/profile/pdf/10-11/18404.E.pdf/.

144 Legislative Council, State of California (2012). AB 644 bill analysis. Retrieved April 30, 2013, from http://www.leginfo.ca.gov/pub/11-12/bill/asm/ab_0601-0650/ab_644_cfa_20120626_093301_sen_comm.html/.

145 Pianta, R. C., Belsky, J., Vandergrift, N., Houts, R., & Morrison, F. J. (2008). Classroom effects on children's achievement trajectories in elementary school. *American Educational Research Journal, 45*(2), 365-397;

Roorda, D. L., Koomen, H. M. Y., Split, J. L. & Oort, F. J. (2011). The influence of affective teacher-student relationships on students' school engagement and achievement: A meta-analytic perspective. *Review of Educational Research, 81*, (4), 493-529.

146 Watson, J., & Gemin, B. (2009). *Funding and policy frameworks for online learning*. Evergreen, CO: Evergreen Education Group. Retrieved October 11, 2012, from http://www.inacol.org/research/promisingpractices/NACOL_PP-FundPolicy-lr.pdf/.

Section III
Claims and Evidence:
The Virtual Schools Research Base

Larry Cuban, Stanford University

Historically, advocates promoting new technologies in schools have promised a great deal. Champions of virtual schooling are no exception. Consider, for example, the answer that Clayton Christensen, author of *Disrupting Class: How Disruptive Innovation Will Transform the Way the World Learns* (2008) gave when asked: "Do you think that education is finally ready for the Internet?"

> I absolutely do. I think that not only are we ready but adoption is occurring at a faster rate than we had thought.... We believe that by the year 2019 half of all classes for grades K-12 will be taught online.... The rise of online learning carries with it an unprecedented opportunity to transform the schooling system into a student-centric one that can affordably customize for different student needs by allowing all students to learn at their appropriate pace and path, thereby allowing each student to realize his or her fullest potential....[147]

Christensen's sweeping claims are typical: that 50 percent of all children and youth will be taught online by 2019, and that U.S. schooling will morph from a teacher-centered, age-graded, one-size-fits-all classroom system to a student-centered system providing fully customized, individual instruction for students across scattered locations. Unfortunately, no research to date justifies either claim.[148,149] The models of virtual education embedded in such predictions—as well as their actual effects on students from diverse backgrounds with disparate abilities and needs—can only be guessed.[150] As indicated earlier in this report, many data are incomplete and allow only uncertain inferences.

Advocates' hyperbole[151] obscures how little is actually known about the effects of online schooling and how difficult it is to determine what constitutes high quality virtual learning. Current research suffers not only from incomplete and sometimes conflicting results, but also from a lack of comparable data. For example, schools studied may be totally non-profit, totally for-profit, or some mix of both, making comparisons difficult.[152] Moreover, available studies use different research designs, reflect the experiences of widely different students, illustrate wide variation in teacher instruction, and define and measure the quality of online teaching and learning in differing ways. For example, students receiving online instruction include: children who are home-schooled; children

with disabilities who are homebound; high school students who are enrolled in Advanced Placement courses, or in International Baccalaureate diploma programs; teenagers who are working toward credit recovery for failed courses; and, elementary school students who are in classes that blend individual "learning labs" with regular classroom instruction.[153]

Differences are also evident in curriculum and instruction.[154] Some virtual schools provide course sections with enrollments as few as fifteen, with teachers holding online discussions, having periodic face-to-face contact, and exchanging frequent email messages. Others showcase teachers lecturing and demonstrating lessons to thousands of students at one time. Some online education relies less on teachers, instead emphasizing engaging

> *Before offering more support for virtual education generally, policymakers would be wise to promote and wait for better information from more stringent research.*

software programs loaded with audio and video clips that take students point-by-point through carefully designed materials. Such programs quiz students on material, then re-teach concepts and skills for students who do poorly while allowing students who do well to push ahead with advanced material.[155] Other programs rely on software stressing rote memorization that depends primarily on short bursts of teacher telling and multiple-choice questions to check understanding, an electronic version of typical, and unengaging, skill-and-drill classroom teaching. When teachers do play a substantive role, the quality of online teaching also varies. There are acclaimed instructors who seem to relish the work, plan thoughtfully, and use the limited face-to-face interaction and discussion threads creatively.[156] Other online teachers simply complete assigned tasks dutifully.

Given such wide and substantive variations, it is difficult to even make sense of the claim that "technological innovation" will revolutionize teaching and learning. What kind of innovation, for which students, taught by whom, for what purpose exactly, using what methods? Can any or all versions of online schooling produce the achievement gains its advocates predict?

Although researchers have asked whether technological innovations produce learning that equals, exceeds, or falls short of the learning that traditional instruction produces, after a half-century of inquiry available data still cannot answer the question. Instead, researchers have produced decades of weak studies that offer little compelling evidence of enhanced student achievement.[157] Unfortunately, virtual school advocates nevertheless routinely cite flawed studies to support their claims.[158] Even more unfortunately, lacking strong evidence, they substitute unsubstantiated claims or misrepresent credible research findings about virtual education to make their case.

Following is a review of typical claims about the superiority of virtual education and some realities they ignore, and then a review of weaknesses in existing research and an example of how findings from credible research are distorted to support a push for technological expansion. Together, this material demonstrates that hyperbolic claims for the superiority

of online teaching and learning rest on a wholly unsupported foundation—despite the claims proponents may make about purported advantages and research support for them.

Tenets of the Faith in Virtual Education

As support for their position, advocates of virtual education typically detail perceived weaknesses of traditional schooling and then claim that virtual education in and of itself will remedy them. Unfortunately, how or why online instruction might reliably alleviate problems often remains unexplained, making it difficult to understand why some weaknesses would disappear if a student were sitting at a computer rather than in a classroom and ignoring the possibility that creative teachers may already be alleviating problems by creating high-energy, face-to-face classrooms. The following claims are commonly made, despite a lack of credible research evidence and without attention to real-world complexities that raise questions about them.

According to many advocates, online instruction alleviates stresses of traditional whole-class instruction. Champions of virtual learning claim that the age-graded school has forced teachers to present the same material to a group of 25-30 students at one time, generation after generation; in doing so this structure has created tedium and boredom for students, given that some will already know the content while others will be too far behind to grasp a lesson. Moreover, proponents point out that teachers facing large class sizes have been hard-pressed to meet district and state requirements for covering the curriculum and moving all students to proficiency.

With online instruction, however, advocates maintain that lessons will become more individualized. Online instruction and blended learning are said to provide "differentiated instruction," taking all learners from where they are today to their full potential tomorrow. Moreover, technological innovations permit some regular classroom teachers to "flip" their lessons. That is, students can prepare for class by watching teacher lectures online at home, or by working through online programs; teachers might then use class time for a variety of activities, like one-on-one conferences and small group work, helping students work through difficulties with content while strengthening their critical thinking, analytical, and problem solving skills.[159]

Such claims are generally made without any attention to real-world complications that affect not only traditional classrooms but that apply to online offerings as well. Unexamined issues include, for example: the extent to which mandated Common Core standards and high stakes testing might limit curricular and instructional creativity in any format; why a lecture that might be boring in person would somehow become an asset in an online environment; and whether re-teaching in a repetitive drill format might be less mind-numbing online than in a traditional classroom.

Another assertion that advocates make is that unlike traditional instruction, virtual learning will energize disengaged and underachieving students. Promoters of online courses and blended learning say repeatedly that unmotivated students will work harder,

gain more knowledge and skills, and embrace learning in an online environment. They predict that newly engaged students will subsequently achieve higher grades and persevere in their studies until they graduate high school. In short, advocates assert that moving instruction online will motivate every student to attain proficiency in knowledge and skills so that they are prepared to enter college or careers in a highly competitive global economy.

Proponents, however, do not explain which intrinsic elements of online education would motivate students who have disengaged because of limited English proficiency or limited literacy, or who need to work long hours to help support an economically distressed family, or who see in their communities no role models or reason to believe they can ever compete fairly in any desirable job market. Again, complex factors that influence individual achievement are not taken into account in sweeping claims about the ability of technology to solve intransigent problems in traditional classrooms.

Advocates also argue that unlike traditional instruction, which is disconnected from the world of work, online instruction will ensure students develop critical competencies.[160] Current content and skills taught in academic subjects, promoters assert, seldom have real-world connections. Moreover, they charge that while high-tech devices are increasingly available in traditional schools, student use is often restricted to low-level tasks, squandering the technology's enormous potential for delivering information and fostering communication. According to this argument, because digital competence is necessary for workers in an information-based economy, students graduate unprepared for life after school. Proponents assert that online instruction will close the gap between what schools offer, what students do in daily lessons, and what youth will face when they graduate.

Again, the assumption that online instruction will automatically provide better preparation for college or the world of work is simply an article of faith, since it can (and often does) rely heavily on low-level tasks like repetitive quizzing and drilling. Moreover, even if complex technological tasks are assigned, it is not clear that such assignments automatically translate to better job skills. For example, students experienced in creating online videos might find that skill less useful in the workplace than the more mundane skills of word processing and spreadsheet manipulation.

Another assertion that proponents often make is that online instruction can stem the rising costs of schooling children and youth. Many point out often that the single largest item in K-12 budgets is salaries for classroom teachers. Because virtual schools, cyber-charters, and blended schools hire fewer teachers, average expenses for online schooling can be lower than costs for operating regular age-graded schools. Finance issues have been explored in detail above, but for the purposes of this discussion, it is worth noting that the national average expenditure for instruction in regular schools is some $10, 000 per student. Costs for virtual schools range on average from $5,100 to $7,700 per student, and for blended schools $7,600 to $10, 200.[161] While there are conflicting estimates of the costs among policy advocates and opponents and some questions about profiteering, few

would question the claim that online instruction can be cheaper than providing a teacher for every class in an age-graded, brick-and-mortar school.

Whether *high quality* online instruction might be cheaper is another question that few backers ask, much less answer. For example, in some cases teachers may be replaced by parents, or other non-professional laboratory aides, who monitor student work and who are unlikely to be expert in the subject at hand.[162] It is possible that lower financial cost may come at the price of weakened teaching and learning.

Lack of Credibility in Claims Citing Research

As just noted, advocates often present the purported advantages of online instruction as self-evident truths; however, they do at times cite research support in an effort to make their arguments more credible. There are two reasons for skepticism about such citations. The first is that there are several weaknesses in the existing research base. The second is that findings of credible research studies can be, and are, taken out of context and misrepresented.

To begin, reliable research results are scant and mixed. The results of meta-analyses of hundreds of K-12 studies do not decisively show that students who take online courses or enroll in full-time virtual schools perform even marginally better than students who are in traditional teacher-led classrooms.[163]And, the research presented earlier in this report demonstrates that the common measures of Adequate Yearly Progress, state school performance rankings, and on-time graduation rates demonstrate no advantage for full-time virtual schools.

Even more striking than a lack of convincing findings to support online education is the weakness of existing studies. Meta-analyses have found few studies of virtual instruction in K-12 schools that meet a minimum threshold for quality of design, sampling, and methods. For example, in the recent and often cited meta-analysis from the U.S. Department of Education (2010) mentioned in Section 2, researchers found:

> *Few rigorous research studies of the effectiveness of online learning for K–12 students have been published*. [Italics in original.] A systematic search of the research literature from 1994 through 2006 found no experimental or controlled quasi-experimental studies comparing the learning effects of online versus face-to-face instruction for K–12 students that provide sufficient data to compute an effect size. A subsequent search that expanded the time frame through July 2008 identified just five published studies meeting meta-analysis criteria.[164]

The authors conclude that these five studies:

> [comprise] a very small number of studies, especially considering the extent to which secondary schools are using online courses and the rapid growth of online instruction in K–12 education as a whole. Educators making decisions about online learning need rigorous research examining the effectiveness of online

> learning for different types of students and subject matter as well as studies of the relative effectiveness of different online learning practices.[165]

In short, given the results of the few rigorous K-12 studies that have been done, there is insufficient evidence for policymakers to promote major online initiatives in either elementary or secondary schools.

Moreover, much of the research being done suffers from bias. Online instruction advocates cite research support for the superiority of virtual education often referring to studies drawn from a mix of academic and vendor-produced work.[166] Since it is unlikely that sponsored research with findings undermining a particular innovation would be funded for very long, at the very least such potentially biased work would need to be confirmed by independent researchers. And, of course, commercial research funders can suppress any study that might yield undesirable findings, even if the researchers they hired produced one.

Another form of bias in studies is evident in the sampling of students and teachers included. As just one example, there is a well-known correlation between poverty and low academic achievement. Therefore, findings based on a study sampling students and teachers from any one socioeconomic level cannot and should not be extrapolated to apply to all teachers and students everywhere, as is common in extravagant claims.[167] In addition, heavy reliance on surveys and self-reports also introduces bias.[168]As any experienced educator knows, a student may be fully convinced he or she has fully mastered material—until an assessment demonstrates little to no mastery. Students who say they are learning more, or learning more deeply or efficiently, are reporting their impressions, which may or may not align with reality.

The fact that the vast majority of research on technological innovation is unreliable has seldom stopped champions of online instruction from pressing policymakers to cite various studies in their recommendations. Thus, poorly designed studies with serious flaws that show student gains in test scores often make media headlines for millions of readers and viewers.[169] Meanwhile, occasional well-designed studies that show modest or no gains turn up in academic journals read by a few hundred researchers. At present, there are simply too many sub-standard studies flowing from self-interested vendors and eager advocacy-driven researchers, and too few well-designed and carefully implemented studies. In fact, the point that the existing research base may make most clearly is that little is certain about the effects of technological innovation.

Unfortunately, that fact is often obscured by articles that misrepresent the findings of the few credible studies that exist. For example, in an article titled “How Online Learning is Revolutionizing Education and Benefiting Students,”[170] Dan Lips has this to say about the U.S. Department of Education meta-analysis noted above:

> While evidence about the effectiveness of K-12 online learning programs is limited, there is reason to believe that students can learn effectively online. In 2009, the U.S. Department of Education published a meta-analysis of evidence-based studies of K-12 and postsecondary online learning programs.[3] The study

> reported that "students who took all or part of their class online performed better, on average, than those taking the same course through traditional face-to-face instruction."[171]

While Lips does concede there is limited evidence, the quote from the study that he includes suggests an unqualified, positive finding relative to student achievement.

A look at that quote in its original context, however, suggests a very different picture:

> *Students in online conditions performed modestly better, on average, than those learning the same material through traditional face-to-face instruction* [italics in original]. Learning outcomes for students who engaged in online learning exceeded those of students receiving face-to-face instruction. . . Interpretation of this result, however, should take into consideration the fact that online and face-to-face conditions generally differed on multiple dimensions, including the amount of time that learners spent on task. The advantages observed for online learning conditions therefore may be the product of aspects of those treatment conditions other than the instructional delivery medium per se.[172]

Lips' discussion ignores the fact that gains were modest and, more importantly, possibly due to factors other than technology. Such manipulation suggests that claims about research-based findings should be read with some skepticism—and checked against complete, original studies.

Politics, not Research, is Driving Policy

If the benefits of technological innovation are so uncertain, as a thoughtful examination of the research base readily demonstrates, then why have local, state and federal policymakers been so quick to endorse classroom expansion of online instruction? Several influences are at work. Although they are understandable, they do not provide a trustworthy foundation for educational policy.

Policymakers are in the public eye. Many state and local school boards and superintendents adopt elements of virtual schooling so that they are seen as technological innovators, ensuring that their districts outpace others. In addition, they can simultaneously be seen as wise budget managers who use technology to increase higher productivity—higher test scores—at a lower cost per student. Symbolic actions matter.[173]

Contemporary culture attaches a certain cachet to technology, equating it with social and economic progress. Even the term "high tech"—like high fashion, high church, high class, high society—conveys a sense of superiority, of modernity and productivity, relative to "low tech" methods and materials like chalkboards. If students are using new technologies, then their schools are seen as modern and preparing the next generation to enter higher education or the labor market with productive skills and knowledge. Being in the vanguard of innovation—as when a school buys iPads and laptops for every kindergarten student—

signals to voters, taxpayers, and parents that the district wants to raise achievement using novel and purportedly engaging modes of instruction to prepare children and youth for an information-driven economy.

For example, facing a bond referendum for $8.75 million, with much of the money earmarked for new technologies, one district superintendent summarized: "We need to keep putting the best technology we can in front of our students, so when they graduate they can compete with students from all over the world."[174] He further framed the issue to voters, in fact, not in terms of demonstrated learning benefits in workplace skills but in terms of keeping up with the Joneses in other districts: "The question … is whether we can be a district that moves forward or [whether we will] just sit here and watch others pass us by." Decision makers who depend upon public support seem to fear that not adopting new technologies, even when funds are short, casts them as shortsighted district leaders failing their students by mindlessly reinforcing traditional instruction and neglecting grave educational problems.

Educational policymakers cannot ignore their public image as leaders because they need public support: critics forget that local boards of education depend on voters for funding. Expanding online instruction to enhance the reputation and status of a school district is often a politically smart move to cultivate community support for future tax levies and bond referenda. The greater the number of whiteboards, iPads and online courses, the more likely that decision makers will be considered visionary and that voters will follow their lead. Because of the expectation that greater reliance on technology will mean lower costs per student, leaders at the state, district and school level can pour money into technology and still be perceived as good budget managers.

In short, policymakers know that business, civic, and community leaders expect them to work tirelessly to improve student academic performance through every available means, including better school organization, governance, curriculum, instruction—and especially better technology. Since World War II, job number one in U.S. schools has been improving schools, making unrelenting reform a policymaker's key strategy for political survival.[175]

Unfortunately, good politics does not automatically result in good policy.

Toward Better Research and Policy

History has demonstrated that good research is an important guide to sound policy. When reliable research consistently finds positive outcomes for particular strategies, policymakers can support them confident that their investment will produce expected returns. Such has been the case, for example, for early childhood education and for career-technical academies, which have both seen widespread policy support based on a reliable research base.[176] Findings over time have helped pinpoint which students benefit from these programs and under what conditions they do so. As a result, growing implementation has produced convincing caches of new evidence demonstrating that

policymakers were wise to design policy based on information researchers had established as credible.

Before offering more support for virtual education generally, policymakers would be wise to promote and wait for better information from more stringent research. There have been some beginning moves toward more focused and reliable investigations. For example, one study was designed to determine what effect, if any, providing lectures online rather than in-person might have on student learning.[177] (In this case, students receiving the in-person lecture fared better.) More such experimental studies focusing on such specific technological strategies, in a wide variety of contexts and with a wide variety of students, are necessary.[178] Of course, as findings emerge, efforts to replicate good studies and confirm or refine findings will also be important. And, collaborations between professional researchers and professional teachers,[179] now common in research on traditional schools, might also be usefully extended in studies relevant to technological innovation.

Well-designed qualitative research studies can also provide crucial insights into such areas as how teachers' and students' beliefs and perceptions influence their actions when new technologies are available, or how new technologies might change students' and teachers' thinking and behavior. For example, in one ethnographic study, researchers established that simply making laptops available to students and teachers did not automatically lead to teachers altering traditional instructional strategies, as is often expected.[180] Instead, the teachers' interrelated beliefs about how children learn, how they define good teaching, and what role technology played in their students' lives determined how the teachers used the laptops; moreover, the study found that middle school culture was an important influence on those beliefs. Another study explored how the use of laptops affected students' literacy practices; it found that those practices had become "more public, collaborative, authentic, and iterative, with greater amounts of scaffolding and feedback provided."[181] However, student use of laptops in this case did not lead to improved test scores or reductions in the achievement test score gap.

Currently, researchers know very little about how students acquire skills, attitudes, and habits of learning online. Much more information is needed about how students learn virtually if effective teaching strategies are to be designed and adopted. For example, what do students think and do when listening to online teachers, and how (if at all) is that different from what they think and do when listening to a live teacher present in a classroom? Do different students feel more or less free to ask questions in virtual v. real environment? Are teachers better able to detect and correct student misunderstandings online or in a classroom? Do the answers to such questions vary by type of student and by subject area?

Perhaps most importantly, researchers must move beyond using test scores as a measure of student success and identify not only which outcomes must be measured but also how to measure them. To take an obvious example, a student's near perfect score on a standardized test of reading might come at too high a cost if he leaves formal education hating to read and with no intention of ever reading a newspaper or book again.

In short, there are numerous critical questions that need to be answered before policy can be designed with confidence in its outcomes. The following examples are intended to be suggestive of the range of concerns, but are far from exhaustive:

- Do students in blended learning situations (clearly defined in terms of hours per day spent working online) do worse than, as well as, or better than similar students in regular classrooms? Of course, "better" would need to be clearly defined in the study's design. Better on a test of course content, for example, or on a measure of some other area, like attitude or perseverance?

- What do elementary and secondary students from low-, middle- and high-income families actually think and do during online teacher-directed lessons taught in real-time, to all students in a class at once? Do they think differently when lessons are posted online for a fixed period of time, so that different students access the same lessons at different times?

- What do online elementary and secondary students from low-, middle, and high-income families actually think and do as they go through step-by-step top-rated math and language arts software programs?

- With which students (which age? gender? ethnicity? socioeconomic status?), under what conditions (blended schooling? real-time online instruction at home? in a classroom? computer lab? with or without aides?), and with what kind of teaching (lecture? peer group interactions? simulations? collaborative project-based learning?) is virtual schooling effective? What are measures of "effective" teaching? (standardized test scores? writing? persistence in school? growth in critical thinking skills?)

- In which academic subjects (science? math? reading? social studies? English?) is virtual instruction more or less effective? How is "effective" to be defined in each area?

- In addition to content mastery, what outcomes are so essential that they must be monitored to be sure that any gains realized through technological innovation are not outweighed by costs in other important areas? (Perseverance? Attitude toward learning or subject area? Citizenship?)

Definitive answers to questions such as these will require multiple, well designed, large- and small-scale studies with careful controls and comparison groups, as well as longitudinal studies tracking students over several elementary and secondary grades.

At the moment, we lack information on these and many other important questions. And, without answers, there is no framework on which to build wise policy.

Recommendations

The current climate of K-12 school reform promotes uncritical acceptance of any and all virtual education innovations, despite lack of a sound research base supporting claims that technology in and of itself will improve teaching and learning.

Therefore, it is recommended that:

- Policymakers suspend requirements that students take online courses in order to graduate from high school. No reliable research has yet shown evidence of benefit from this practice.
- Policymakers refrain from establishing or further expanding full-time, taxpayer-funded virtual schools. No reliable research has yet demonstrated under what conditions, in what format, and in what specific ways virtual schools may present an advantage over existing bricks-and-mortar schools.
- State and federal policymakers create long-term programs to support independent research and evaluation of specific student learning outcomes for cyber schools, blended learning schools, and similar ventures.

Notes and References: Section III

147 Myers, C. (2011). Clayton Christensen: Why online education is ready for disruption now. *The Next Web*. Retrieved November 13, 2011, from http://thenextweb.com/insider/2011/11/13/clayton-christensen-why-online-education-is-ready-for-disruption-now/.

148 Current estimates of enrollment in online offerings suggest that such claims of exponential growth are ill-founded. For example, according to the U.S. Center for Education Statistics, there are some 55 million preK-12 students in American schools (http://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb11-ff15.html/). Therefore, some 27.5 million students would need to engage in virtual learning to realize Christensen's prediction—a staggering difference from current enrollments. This reports finds, for example, that enrollment in full-time virtual schools is now some 200,000 students—less than half of one percent of the student population. A more inclusive estimate, based generously on the most recent iNACOL estimates of enrollment in full-time virtual schools and in individual courses (http://www.inacol.org/press/docs/nacol_fast_facts.pdf/), suggests that some 2,000,000 students—4% of the total student population—are engaged in online learning.

See also:

Watson, J., Murin, A., Vashaw, L., Gemin, B., & Rapp, C. (2011). *Keeping pace with K-12 online learning: A review of state-level policy and practice*. Evergreen, CO: Evergreen Education Group. Retrieved May 6, 2012, from http://kpk12.com/cms/wp-content/uploads/KeepingPace2011.pdf/.

149 That most classroom teaching remains largely teacher-centered rather than student-centered, see:

Cuban, L. (2013). *Inside the Black Box of Classroom Practice: Change without Reform in American Education* Cambridge, MA: Harvard Education Press.

Examples of schools where individualized pacing of lessons—one version of student-centered instruction—exist in scattered places across the U.S. The School of One in New York City (http://schoolofone.org/) and elsewhere is one example, and Carpe Diem (http://www.carpediemschools.com/) is another. Numbers attending such full-time virtual schools where customized lessons are the norm enroll a fraction of 1 percent of U.S. students. Researchers have yet to establish whether such schools have students who perform academically as well, better, or worse than students in traditional schools.

150 Silver, N. (2012). *The Signal and the Noise: Why So Many Predictions Fail—But Some Don't*. New York: Penguin Press, 122-138.

151 Other examples of extreme claims for virtual schools can be found at:

Lips, D. (2010, January 12). *How online learning is revolutionizing education and benefiting students*. Washington, DC: Heritage Foundation. Retrieved April 30, 2013, from http://www.heritage.org/research/reports/2010/01/how-online-learning-is-revolutionizing-k12-education-and-benefiting-students/.

See also work by prominent proponent of online instruction Tom Vander Ark:

Vander Ark, T. (2012, June 8). How digital learning is boosting achievement. *Getting Smart* blog. Retrieved June 8, 2012 at, from http://gettingsmart.com/blog/2012/06/how-digital-learning-is-boosting-achievement/.

152 For an example of a full-time state-sponsored online school, see Florida Virtual School at: http://www.flvs.net/Pages/default.aspx.

For an example of a non-profit full-time online school that pays a for-profit firm (K12 Inc.) a substantive portion of its revenues , see:

http://www.k12.com/agora/ and
http://seekingalpha.com/article/395771-k12-manifesting-its-corporate-destiny/.

153 The terms online learning and blended learning here refer to:

> [A] wide range of programs that use the Internet to provide instructional materials and facilitate interactions between teachers and students and in some cases among students as well. Online learning can be *fully online,* with all instruction taking place through the Internet, or online elements can be combined with face-to-face interactions in what is known as *blended learning* [original italics].

This definition comes from:

U.S. Department of Education (2012, January). Understanding the implications of online learning for educational productivity. Washington, DC: Office of Educational Technology, U.S. Department of Education, v.

Synonyms for online instruction, past and present, are "distance learning," "virtual learning," "cyberlearning," and "e-learning."

Blended learning, a combination of individual online instruction and whole or small group instruction in regular public school buildings has emerged recently in K-12, particularly in charter schools. Entrepreneurs, both for-profit and non-profit, and educators have developed various models of mixing online and direct classroom contact between teachers and students. See:

http://www.innosightinstitute.org/media-room/publications/education-publications/classifying-k-12-blended-learning/.

The use of "virtual learning" here refers to online courses, hybrid or blended schools and "flipped classes" (when teachers assign students videos or online presentations to do as homework and then use actual classroom time for discussions and analysis of those videos and online presentations).

154 For descriptions of different ways of teaching in K-12 online courses, see:

Watson, J. (2007, April). *A national primer on k-12 online learning*. Vienna, VA: North American Council for Online Learning, 10-15.

155 In New York City's pilot model of "The School of One," individual online lessons were created for students that were customized to their academic skill level in reading and math. See
http://schoolofone.org/concept.html/.

For elementary school English language learners, see "Rosetta Stone" and for math, "Buffalino." In 2012, Rocketship Learning Labs used both these at Las Suenos Elementary School in San Jose.

Fensterwald, J. (n.d.) Leaning labs 101 *Scholastic administrator* Retrieved April 30, 2013, from
http://www.scholastic.com/browse/article.jsp?id=3757077/.

156 For a picture of what an award-winning online teacher does during the day, see a video on a typical day for Kristen Kipp—online teacher of 2011—at:
http://www.youtube.com/watch?feature=player_embedded&v=M8NpTDsScjg#!/.

157 Christensen, C., Johnson, C., & Horn, M. (2008). *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns*. New York: McGraw Hill;

Wolpert-Gawron, H. (2011, April 28). Blended learning: combining face-to-face and online education. *Edutopia*. Retrieved April 30, 2013, from http://www.edutopia.org/blog/blended-online-learning-heather-wolpert-gawron/ .

Susan Patrick *et al*. have this to say about the question of whether and how online learning benefits students:

> Online learning is becoming more common—but is it a better way for students to learn than traditional schools? In some ways the answer is clearly yes. Some students are, for example, taking Advanced Placement courses that they would otherwise not have access to if it was not for an online course. They are better prepared for college or career having had the option to take the online course. Students who attend an online school as a last resort because they have not succeeded in traditional schools, or students who are physically unable to attend traditional schools, are also clearly better off because of the online option.
>
> But what of the many other students who are choosing online schools when they might instead remain in the traditional classroom—is the online school a better option for them?
>
> The simplest answer to that question is we do not know, because most state accountability and data systems can't easily provide the information about individual student growth on mastery outcomes that is necessary to produce the answer (p. 3).

Patrick, S. *et al*. (2012, October). *Measuring quality from inputs to outcomes: Creating student learning performance metrics and quality assurance for online schools*. Vienna, VA: International Association for K-12 Online Learning.

158 Clark, R. (1983.) Reconsidering research on learning from media. *Review of Educational Research, 53*, 445-59;

Roblyer, M.D. (2007). A deconstructed example of a type 4 study: Research to monitor and report on common uses and shape desired directions. *Contemporary Issues in Technology and Teacher Education* [Online serial], *7*(1). Retrieved April 30, 2013, from http://www.citejournal.org/vol7/iss1/seminal/article1.cfm;

Patrick, S. *et al*. (2012, October). *Measuring quality from inputs to outcomes: Creating student learning performance metrics and quality assurance for online schools*. Vienna, VA: International Association for K-12 Online Learning.

159 Authors have not found research studies of "flipped classrooms" that are experimental or quasi-experimental in design. Still, educators and journalists have written extensively about this model, often in glowing terms. See:

Gerstein, J. (2011). The flipped classroom model: A full picture. *User Generated Education* blot. Retrieved April 30, 2013, from http://usergeneratededucation.wordpress.com/2011/06/13/the-flipped-classroom-model-a-full-picture/;

Toppo, G.(2011, October 7). Flipped classrooms take advantage of technology. *USA Today*. Retrieved April 30, 2013, from http://usatoday30.usatoday.com/news/education/story/2011-10-06/flipped-classrooms-virtual-teaching/50681482/1/.

160 See, for example:

NCREL and Metiri Group (2003). Engauge 21st century skills: literacy in the digital age. North Central Regional Educational Lab, 2003. Available at http://pict.sdsu.edu/engauge21st.pdf

161 Natale, C. (2011, July 15). *Teaching in the world of virtual k-12 learning* (report). Princeton, NJ: Educational Testing Service, 16-18;

Battaglino, T. *et. al.* (2012). The costs of online learning (Working Paper). Washington, DC: Thomas B. Fordham Institute, 6.

162 Author L. Cuban interviewed John Danner, CEO of Rocketship Schools, on January 30, 2012. Danner stated that he can save a half-million dollars a year in teacher salaries by hiring "Learning Lab" aides—parents and college students—to monitor and help students while they are going through software programs on individual computers in the "Learning Lab."

163 Cavanaugh, C. *et. al.* (2004). *The effects of distance education on k-12 student outcomes: a meta-analysis.* Faculty Research Paper, University of North Florida.

The most exhaustive meta-analysis was completed by Barbara Means, *et. al.*:

Means, B. *et. al.* (2010). *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. Washington, DC: Office of Planning, Evaluation, and Policy Development, U.S. Department of Education. Retrieved April 30, 2013, from http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf/.

Means cited the Cavanaugh study.

164 Means, B. *et. al.* (2010). *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.* Washington, DC: Office of Planning, Evaluation, and Policy Development, U.S. Department of Education, xiv. Retrieved April 30, 2013, from http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf/.

165 Means, B. *et. al.* (2010). *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.* Washington, DC: Office of Planning, Evaluation, and Policy Development, U.S. Department of Education, 54. Retrieved April 30, 2013, from http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf/.

166 Watson, J. (2007, April). *A national primer on k-12 online learning*. Vienna, VA: North American Council for Online Learning.

Watson worked for Evergreen Associates, another online instruction advocacy organization. Out of a 42-page document, just over one page dealt with effectiveness of virtual instruction citing two studies. One retrospective study, using no controls, compared the national rate of students passing Advancement Placement Exams in three virtual programs with the national pass rate. Virtual schools did better. The other study Watson cited and quoted was a meta-analysis that contained a paragraph that pointed out the dearth of studies and, while showing modest gains for virtual instruction over traditional lessons, said:

> this conclusion should be described as showing promise, but with the realization that we cannot have real 'confidence' in these conclusions until there is much more support available from high-quality quantitative research . (quoted in Watson, 2007, p.25).

See also:

Smith, R., Clark, T., & Blomeyer, R.L. (2005, November). *A synthesis of new research on K-12 online learning*. Naperville, IL: Learning Point Associates, 18.

167 See Watson, J. (2007, April). *A national primer on k-12 online learning*. Vienna, VA: North American Council for Online Learning, 24-25.

168 Burrus, R. *et. al.* (2007). Self-reports of student cheating: does a definition of cheating matter? *Journal of Economic Education*, *38*(1), 3-16;

Maxwell, N. & Lopus, J. (1994). The Lake Wobegon effect in student self-reported data. *The American Economic Review*, *84* (2), 01-205.

169 A randomized experimental design in a Maine school district where iPads were bought and deployed in a pilot program produced headlines and attention from both enthusiasts and skeptics. Five year-olds with iPads were supposedly scoring higher on certain tests than those peers without iPads. See:

Bebell, D. *et. al.* (2012, February). *Emerging results from the nation's first kindergarten implementation of ipads: Report to Auburn (ME) Board of Education*.

For analysis of the flawed findings, see :

Reich, J. (2012, March). What should we do with the Auburn kindergarten ipad findings? *Justin Reich* blog. Retrieved April 30, 2013, from http://www.edtechresearcher.com/2012/03/what-should-we-do-with-the-auburn-kindergarten-ipad-findings/.

170 Lips, D. (2010, January 12). *How online learning is revolutionizing education and benefiting students*. Washington, DC: Heritage Foundation. Retrieved April 30, 2013, from http://www.heritage.org/research/reports/2010/01/how-online-learning-is-revolutionizing-k12-education-and-benefiting-students/.

171 The study cited is

Means, B. *et. al.* (2010). *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. Washington, DC: Office of Planning, Evaluation, and Policy Development, U.S. Department of Education, xiv. Retrieved April 30, 2013, from http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf/.

172 Means, B. *et. al.* (2010). *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. Washington, DC: Office of Planning, Evaluation, and Policy Development, U.S. Department of Education, xv. Retrieved April 30, 2013, from http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf/.

173 The discussion on symbolism of technology in K-12 schools and in the larger culture is drawn from Henderson, K. (1998). *On Line and On Paper*, Chapter 8. Cambridge, MA: MIT Press;

Meyer, J. & Rowan, B. (1983) Institutional organizations: Formal structure as myth and ceremony, in Walter Powell and Paul DiMaggio (Eds.) *The New Institutionalism in Organizational Analysis*, 41-62. Chicago: University of Chicago Press;

Pfeffer, J. (1981).Management as symbolic action: The creation and maintenance of organizational paradigms. *Research in Organizational Behavior, 25,* (3), 1-52.

174 Perkins, I. (2007, February 22). Schools ask voters to fund tech push. *Detroit News*, 2B.

175 Hess, F. (1998) *Spinning wheels: The politics of urban school reform*. Washington, DC: Brookings Institution Press.

176 For preschool policy trends, see

Jacobsen, L. (2007, November). States moving to universal pre-k? *Education Reform* (Policy Brief, Education Writers Association).

Lerner S. (2012, December 4). Pre-K on the Range. *The American Prospect*.

For positive outcomes, see, for example, a study of Perry preschool program at http://www.highscope.org/content.asp?contentid=219;

And a study of Abecedarian schools in North Carolina at http://evidencebasedprograms.org/1366-2/abecedarian-project.

For an overview, see

Heckman, J. (2006, June 30). Skill formation and the economics of investing in disadvantaged children," *Science, 312*, 1900-1902.

For career academy trends, see

Kemple, J. (2008, June). Career Academies: Long-Term Impacts on labor market outcomes, educational attainment, and transitions to adulthood. New York: MDRC. Retrieved April 30,2013, from http://www.mdrc.org/career-academies-4.

See also:

Edutopia Staff (2010, September 27). Career and technical education: research roundup. *Edutopia.com*, which includes two articles by David Stern and Marisa Saunders and Erika Hamilton on the expansion of academies and the research policymakers used to justify spread of these programs. Retrieved April 30, 2013, from http://www.edutopia.org/stw-career-technical-education-research-roundup/.

177 See, for example,

Figlio, D., Rush, M., & Yin, L. (2010, May). Is it live or is it internet? *Experimental estimates of the effects of online instruction on student learning,* (Working Paper No. 16089). Cambridge, MA: National Bureau of Economic Research.

Such experimental/control designs are difficult to implement in K-12 settings for many reasons, primarily because children and youth are compelled to attend school and parental permission must be secured and treatments for some but not other children cannot be with-held. However, a number of researchers have overcome obstacles and carried off these kinds of studies. See :

Slavin, R. *et. al.* (2010, January). Effective reading programs for the elementary grades: A best evidence synthesis. Baltimore, MD: Best Evidence Encyclopedia (BEE), Johns Hopkins University School of Education, Center for Data-Driven Reform in Education. See: www.bestevidence.org

178 Amiel, T. & Reeves, T. (2008). Design-based research and educational technology: rethinking technology and the research agenda. *Educational Technology and Society, 11* (4), 29-40;.

Wang, F. & Hannafin, M. (2006). Design-based research and technology-enhanced learning environments. *Educational Technology Research and Development*, 53(4), 5-23.

179 See, for example, Brown, A. (1991). Design experiments: Theoretical and methodological challenges in creating complex interventions in classroom settings. *The Journal of The Learning Sciences, 2*(2), 141-178.

180 Windschitl,M. & Sahl, K.(2002). Tracing teachers' use of technology in a laptop computer school: The interplay of teacher beliefs, social dynamics, and institutional culture. *American Educational Research Journal*, *39*(1), 165-205.

181 Warschauer, M. (2008).Laptops and literacy: A multi-site case study. *Pedagogies: An International Journa*l, *3,* 64.

Appendices

Appendix A: Summaries of Enacted State Legislation Pertaining to Virtual Schools

Appendix B: Numbers of Full-time Virtual Schools and the Students They Serve by State

Appendix C: Demographic Characteristics of Students Enrolled in Full-Time Virtual Schools

Appendix D: State Performance Ratings, Adequate Yearly Progress Status, and Reasons for Not Meeting AYP

The Appendices are available for download as PDF files at

http://nepc.colorado.edu/publication/virtual-schools-annual-2013.

Appendix A is contained on one file, and Appendices B, C, and D are contained on a second file.