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VIRTUAL SCHOOLS IN THE U.S. 2013:
POLITICS, PERFORMANCE, POLICY, AND RESEARCH EVIDENCE

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

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May 2013

Scaling up virtual school reform presents significant implementation and accountability challenges, as several recent research and technical reports on virtual schools have illustrated.[1] 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,[2] 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

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?

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

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.[3] 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.[4] 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.[5] Facilities and maintenance, in most cases the second highest cost, can amount to nearly 18% of a school's budget.[6] 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.[7] 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.[8] Such efforts to identify how various cost drivers affect overall expenditures across different schooling models are an important step toward determining appropriate funding allocations.[9]

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.[10] 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.[11] 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),[12] 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.[13] 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.[14] 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).[15] 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.[16]

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.[17] 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.[18] 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.[19] 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.[20]

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.[21] In Pennsylvania, 42% of virtual

schools paid management companies in 2010-11, with one school paying approximately $1,300 per student in management fees.[22] 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."[23]

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.[24] Table 2.2 outlines issues, assumptions and questions relevant to instructional quality.

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.

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?

Policymakers may find the *iNACOL National Standards of Quality for Online Courses*[25] 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,"[26] 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."[27] 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.[28] 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).[29]

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.[30] 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.[31] 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."[32] 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.[33] 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.[34] 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.[35] 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.[36] 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"[37] including formative assessments for feedback, summative assessments to demonstrate achievement, and "validating assessments to protect high levels of rigor."[38] 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.[39] 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.[40] 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.[41]

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

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"[42] 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."[43] 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.[44] 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.[45] 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.

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?

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.[46] 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.[47]

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.[48] 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.[49] 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,[50] 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.[51] 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.[52] 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.[53] 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.[54] 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[55] 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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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/.

4 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/.

5 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.

6 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.

7 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/.

8 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).

9 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/.

10 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/.

11 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.

12 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.

13 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.

14 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/.

15 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/.

16 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/.

17 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.

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

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

20 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.

21 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/.

22 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.

23 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/.

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

25 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/.

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

27 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/.

28 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.

29 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/.

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

31 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/.

32 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

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

34 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.

35 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.

36 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/.

37 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/.

38 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/.

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

40 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.

41 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.

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

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

44 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/.

45 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.

46 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).

47 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).

48 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/.

49 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

50 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/.

51 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/.

52 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/.

53 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/.

54 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.

55 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/.

*This is a section of **Virtual Schools in the U.S. 2013: Politics, Performance, Policy, and Research Evidence**, a research brief published by the National Education Policy Center, housed at the University of Colorado Boulder, and made possible in part by funding from the Great Lakes Center for Education Research and Practice. The entire brief, as a single document and in individual sections, is available at http://nepc.colorado.edu/publication/virtual-schools-annual-2013/.*

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