Getting Students More Learning Time Online

Distance Education in Support of Expanded Learning Time in K-12 Schools

Cathy Cavanaugh   May 2009

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Executive summary and introduction

Internal and external forces are simultaneously transforming elementary and secondary education. Complementary changes within the K-12 education community are sweeping schools in the form of one-to-one computing, online learning for students and teachers, and differentiated instruction. Students can choose from among schools, courses, and powerful educational tools and resources that never before existed. As a result, education for many students today bears little resemblance to their parents' education. This transformation is a positive change when students are connected with the tools and opportunities that meet their individual needs.

Local and national economic conditions, increasing ethnic and cultural diversity, and global forces are among the new and growing external pressures on American elementary and secondary schools. Schools alongside families form the foundation for successful participation in communities, the workforce, and our democracy, and their job has therefore grown more complex and challenging. American schools, when compared to other developed nations, appear to need new approaches that increase their capacity to prepare students academically.

Glossary of terms

Distance education: A broad term that encompasses forms of electronically mediated teaching and learning where instructors and students learn at different times and/or places through video, radio, web, and combination formats.

Online education: Teaching that occurs though digital, rather than analog, communication.

Virtual schools: Web-based distance education programs for K-12 students. These are also called cyber schools, cybercharters, electronic schools, and e-schools. Virtual schools offer full-time or supplemental programs, and in some cases both.

Blended learning: Courses or programs that combine face-to-face and distance experiences.

Policymakers and educators alike have proposed using expanded learning time in schools as a means to improve student academic performance. Expanded learning time seeks to increase student learning by lengthening the school day and/or year, or by supplementing class time with extracurricular activities for students schoolwide. Early demonstrations of expanded learning time initiatives show success in raising student achievement, but can pose challenges to families and community stakeholders by requiring increased investment in spending and resources.

Distance education can offer an approach to expanding school learning time that allows for more flexible and individualized learning through the application of new technologies.

Distance education changes the meaning of learning time by putting the learners themselves in control. Distance courses in effect "macromanage" time by specifying broad timelines for the course and its activities. Students become the micromanagers who make the specific decisions about how much time to spend on each activity and usually when to spend the time, as well. The self-managed, just-in-time nature of learning in a distance course enables learners to expand their learning as needed throughout the duration of the course with the teacher's support and within his or her parameters.

Self-paced courses allow students who learn quickly to complete courses at a pace that remains engaging and avoids boredom before they move on to the next course. Flexible courses give students who need more time and practice to accomplish course objectives the built-in opportunity to take the time without the stigma of asking for an exception to a rigid calendar. Millions of K-12 students have taken control of their learning time in distance courses.[1] Distance education, as a learner-centered approach to education, is an efficient learning environment that focuses the teacher's attention on the specific performance of individual students, guiding them as needed to achieve success.[2] The student-teacher relationship is immediate and personal.

Interest in K-12 distance education is undeniable. The number of elementary and secondary students taking online courses increased tenfold between 2001 and 2007, from about 200,000 to almost 2 million, and could easily reach several million by 2012.[3] As of 2008, 44 states have either significant supplemental online learning programs, which are designed to add courses to the offerings available to students in their face-to-face schools, significant full-time programs in which students take most or all of their courses online, or both. Several of the states that do not have established K-12 online learning programs are in the planning stages of creating them.[4]

Online courses have also attracted teachers at a time when teacher retention in the profession is a critical national concern. Virtual schools regularly receive thousands of applications for each online teaching position. University teacher education programs have begun to respond to the inevitability of K-12 distance education by including online teaching competencies in their teacher education programs.[5] States such as Georgia and Wisconsin have added online teaching requirements to their teacher certification systems.

Research and evaluation studies support the effectiveness of K-12 distance learning. Comprehensive reviews of research published in 2001 and 2005 showed that student academic performance in well-designed online courses is on average equivalent to performance in high-quality classroom-based courses.[6] And course design, teaching and student outcomes all continue to improve. Virtual schools show that their students achieve academic standards on state achievement tests on a regular basis. In many cases, students who failed their required high school courses in traditional schools passed online courses based on the same standards.[7] A study of algebra courses taught by state-certified teachers using the state curriculum in public traditional and virtual schools showed, for example, that students in both schools achieved at equivalent levels on a nationally normed exam.[8]

Virtual schools have developed online course designs that effectively educate students who have needs ranging from acceleration to credit recovery,[9] including students with physical and learning disabilities.[10] Leading virtual schools have documented Advanced Placement-taking rates and passing rates (scores of 3 or higher) that greatly exceed the state and national averages.[11] Virtual schools have helped students performing below basic level on prior state tests get back on track, moving from basic to proficient or advanced levels. And virtual school participation has been seen to narrow the state testing achievement gap for those in economically disadvantaged subgroups.[12]

Distance education also supports visions of 21st-century schooling. In an era of increased complexity of information, careers, and global relationships, groups such as the Partnership for 21st Century Skills advocate for new school and curriculum designs.[13] These models emphasize skills focused on creative problem-solving, synthesizing, and integrating information; use of networks and workgroups; the importance of understanding multiple perspectives; and the ability to communicate effectively in multiple media. This vision requires both physical and virtual learning environments that focus on learner needs, essential skills, and community relationships in ways that are synergistic with distance education.

Online courses increase equitable access to quality educational opportunities by bringing flexibility to the course calendar, expanding the course catalog, and offering individualized instruction. Distance education for students who choose supplementary online courses is already a form of expanding learning time. Yet because these programs have been selectively deployed by state and local education agencies, it is available only to students who live in select areas; have access to the technology needed for online learning; and have the time, space, and instructional support needed to succeed in a relatively independent learning experience.

This report outlines the rationale for and steps toward making distance education courses uniformly available to expand school learning time. It also outlines some of the urgent needs in American education today and explains how school districts and educators can use K-12 distance education to address them.

Improving the quality of instruction: Time, teaching, and curriculum
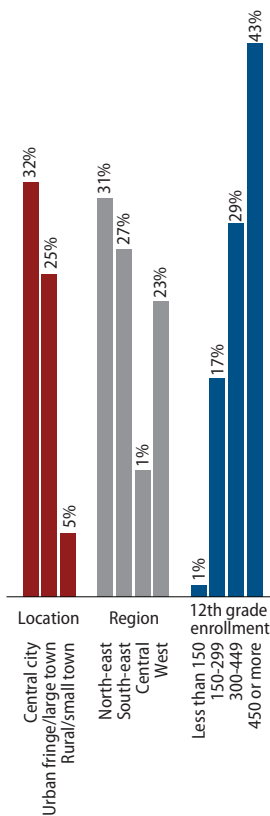
The amount of quality instruction that students receive throughout their developing years is a primary factor driving academic achievement. Inequities within the American K-12 education system are largely the result of unequal access to skilled, effective teachers and a quality curriculum, including specialized teachers and course materials for students whose needs are outside of the mainstream.[14] Some of these problems stem from the unequal distribution of resources, which can restrict a school's ability to place highly qualified teachers and engaging educational materials in each classroom.

Time is one of the most valuable resources for learning. Even a few days' difference in learning time among schools can determine whether a school makes adequate yearly progress.[15] And students in high-achieving countries have more learning time in school per year on average.[16]

Other differences between the United States and other high-achieving counties relate to teaching and curricula. High-achieving countries are more likely than the United States to inspire and support potential teachers with a compelling social mission, to require teacher education degrees, and to provide mentoring and ongoing professional development for teachers.[17] The school curriculum of those high-performing countries also focuses on critical thinking, problem solving, and real-world investigations to a greater extent than American schools.

School reformers looking to serve the needs of all students have made seemingly contradictory calls for smaller schools and learning communities that personalize learning, and for a broader course catalog that offers special education, workforce, credit recovery, and advanced courses. Smaller schools have the greatest disadvantage in their ability to offer a broad range of courses to meet student needs, as shown in Figure 1.

How can distance education improve the quality of instruction?

Virtual schools have high standards for teacher quality and are able to attract teachers who might otherwise have left the profession if not for the flexibility afforded by teaching online.[18] Not all teachers prefer the unique demands of full-day distance teaching, but a

school day that blends face-to-face teaching with the extended interpersonal contact of online teaching has appeal for many. The most effective virtual schools employ teachers who have state certification in their subjects and classroom teaching experience, and participate in comprehensive professional development in online teaching. Fifty-six percent of virtual schoolteachers have advanced degrees,[19] compared with 48 percent of teachers in the United States on average,[20] giving online students access to teachers with high levels of content knowledge and pedagogic expertise.

Virtual schoolteachers possess skills essential to America's next-generation teaching force. High proportions of them use teaching practices associated with high student achievement, such as student-centered approaches, collaborative learning, independent inquiry and research, and student discussion.[21] Effective online teachers learn online teaching skills such as communicating frequently and supportively with students, and organizing content in clear and detailed ways for independent online students. They are likely to transfer their improved skills in ways that increase their success when they return to classroom teaching.[22]

Online course teachers are likely to have higher technology skill levels than classroom teachers. All online teachers make use of communication and instructional technology, but only 19 states have a technology requirement for classroom teachers' initial credentials, and just 10 states require technology professional development or testing for recertification.[23] Teachers who utilize technology prepare their students with a rich and important array of communication skills that will benefit them as active members of an evolving democracy and help supply the United States with the technologically skilled workforce it needs.[24]

Newer teachers tend to place higher value on technology skills than more experienced teachers, which may give online students an advantage since virtual schoolteachers have less teaching experience than the U.S. public school average. Fifty-five percent of teachers in U.S. public K-12 schools have taught for 10 years or more,[25] while only 38 percent in U.S. virtual schools have taught for at least 10 years.[26]

Distance education shows promise as an effective solution for increasing student access to quality teachers and courses. Distance education is available to a small but growing minority of American students and students in a few other countries, including Singapore, Mexico, and Australia. Broader access to online courses would narrow the gap between American students' academic performance and that of higher-performing countries. It would also give the United States an academic advantage over countries where distance education is not used. But the practical viability of using distance education for expanding learning time in ways that shrink education gaps depends on how it is designed to fit into the K-12 education system.

Scenarios from 21st-century learning environments

Some schools are already demonstrating the potential of using distance education to expand learning time in the context of a 21st-century environment by building on a traditional school day (Table 1) or reconfiguring the school day (Table 2).

The schools profiled here are based on currently operating programs that were developed to serve specific student needs, such as high-need and high-poverty populations, using innovative approaches tailored to the times and places where teaching and learning happen. The programs were not conceived specifically as expanded learning time programs, but many have expanded the learning time available for students. These examples represent successful steps toward implementation of deliberate school designs that expand learning time with online courses.

These new strategies required each school to rethink how it facilitates and individualizes student learning, how it provides professional development, how it encourages communication in teaching and learning, how it integrates community resources, and how it funds education. The example schools applied an expanded conception of stakeholders' roles in education in order to expand access to education. Some schools shared per-pupil costs with online course providers, and others funded the program at the state level.

The schools found that freeing teachers from the constraints imposed by working with growing numbers of students for short periods of time in the classroom allowed them to focus on more specific student needs using communication technology. They could also individualize motivational techniques. Teachers had greater latitude in choosing the activities that are best accomplished face-to-face and those that work well online.

Schools using these models are still able to preserve time blocks for student athletic and extracurricular activities and part-time jobs. School days can begin earlier and end very late, with students attending scheduled classes and working on courses in a flexibly scheduled computer lab. Time spent in the school building can be reduced with the addition of online courses accessed by students outside the school building. Partnerships with student employers may result in computers located in the workplace for access to online classes before and after work hours. And Internet-connected mobile devices such as netbooks and smart phones can allow students to access online courses while traveling among home, school, work, and athletic events. Online teachers can integrate these aspects of students' lives by building projects around personal experiences. Multitudes of educational possibilities become reality once the boundaries of time and place are removed.

Schools that use online learning to supplement class time allow students to stay at school for an expanded period of time each day. While at school, they attend the same range of courses as they did during a traditional school, with the addition of online and blended courses taught by remote teachers. The Florida Virtual School and Chicago VOISE programs have

online students gather in centers designed specifically to support their online learning efforts and staffed by tutors or facilitators. Kentucky's teachers use online materials to augment their classroom activities and expand the coursework into the after-school hours.

Table 1. Expanding the traditional school day

School model	Class types	Community and cultural impacts	Examples
Adding distance education onto the current school day.	After-school online tutoring connected to school classes. After-school online courses as a supplement or to add courses not offered in school.	Teachers gain access to a local or broad-scale professional learning community through school-based and online colleagues.	Florida Virtual School plans e-learning centers where students can take online courses after school.
Infusing distance education into a potentially longer school day.	Blending online experiences into expanded school classes. Replacing school classes with online classes.	Teachers may transfer new online and blended teaching skills to their classrooms. Teachers may have access to a large mentoring network, as masters or apprentices. School-based teachers may have opportunities to co-teach courses with online colleagues.	Kentucky Virtual School makes online courses and modules available for blending into classroom courses. Cincinnati Public Schools offers online courses to students in school gifted programs. Louisiana Virtual School partners certified online algebra teachers, including some in high-need rural schools, with classroom students and tutors working to become certified. Chicago's VOISE program offers self-paced online courses with teachers in a school lab.

Chicago's VOISE program makes a particular effort to structure the school day to provide each student with the time and supportive relationships he or she needs to master courses and complete high school. Students may register for courses without schedule conflicts or concerns about "filling seats" in classrooms because the school offers a broad catalog of online courses. Students have the opportunity to add courses to their programs seamlessly, knowing that on-site teachers are available to help them.

The Florida Virtual School program is an example of a school that can expand learning time for students who take online courses and can also expand professional learning opportunities for teachers. The school's large size allows it to offer workshops for teachers and leaders on a daily basis, removing barriers to development on the career ladder.

Other schools reduce, rather than supplement, face-to-face class time and add online course time. Students at Nevada's Odyssey Charter School, Chicago's Virtual Charter School, and Indiana's Hoosier Academy all attend classroom sessions with teachers and other students on designated weekdays and learn online on the other days. Pennsylvania's Commonwealth Connections Academy program offers as-needed classroom time with teachers to augment the online learning time.

Table 2. Reconfiguring the school day

School model	Community and cultural impacts	Examples
Part-time attendance in school plus online learning.	The home and community are valued and formalized components of the learning environment. Students have flexibility to participate in community events and service activities.	Odyssey Charter School of Nevada offers online students a weekly meeting with mentors and a learning strategies course. The Chicago Virtual Charter School brings online students together one day each week for instruction, remediation, parent workshops, and club activities. The Hoosier Academy of Indiana balances online learning with two days in school each week.
Fluid individualized combination of school-site and online learning.	Families and school staffs have opportunities for flexible scheduling and job-sharing, enabling adults to participate more fully in professional development and continuing education.	Commonwealth Connections Academy in Pennsylvania offers online students a drop-in center where teachers work. Students come as needed for instruction and school activities.

Success factors for expanding learning time through distance education

Existing distance education programs and research offer guidance to schools and districts that are interested in implementing large-scale K-12 expanded learning time initiatives centered on distance education. Success depends on students, teachers and staff, curriculum and materials, program models and courses, communities, and costs. This section outlines how these factors would come into play and work effectively in an expanded-learning environment.

On-site facilitation for guided learning

Highly interactive teacher-led online courses provide students access to personalized instruction, but also requires them to work independently. Successful students are able to follow online instructions and complete assignments under their own initiative, knowing when to ask for help. The study habits students need for distance learning differ somewhat from those needed in classrooms, and their effectiveness varies across students. Elementary and middle school students, as well as struggling students, are relative novices in self-monitoring. They require scaffolding and time to develop independence and expertise. Successful expanded learning time schools that incorporate distance education therefore should include and prepare parents, online tutor/mentors, and site facilitators who can work at the location where the student accesses courses.

Individualized curricula and instruction

A school that chooses distance education to expand the school day or year should consider individualized curricula and instruction. Instructional methods and materials in online courses must be designed and sequenced to suit students' unique developmental levels. Younger learners and those with a weaker academic foundation need more adult facilitation, smaller lesson chunks, fewer choices in their coursework, more explicit instructions, more assistance with organizing their efforts and materials, and access to a wider range of tutorial and help applications.[27] Many virtual schools use orientation courses that acquaint students with the online learning environment and provide formative feedback to students about their performance as online learners in order to help students determine the specific forms of assistance they most need as online learners.

Students in online courses spend significant time working independently with concepts and digital resources. Courses that are designed to require more time actively practicing and applying the course content through writing and speaking generally lead to higher achievement, as do simulations, manipulatives, and tutorials that offer student feedback.[28] Getting the most out of online learning activities depends on a student's skills in locating and evaluating information, among other important information and communication technology skills. Teachers and course designers should expect some students to need opportunities to develop these skills before applying them in the content they are learning. Students who are struggling to simultaneously learn demanding content and pick up the necessary technical skills tend not to succeed at either effort.[29]

The specific nature of online instruction depends on the model of virtual schooling that is adopted. Table 3 shows common components of a range of virtual school models. Promising programs exist within each of these models. Hundreds of state, local, and private virtual schools can share success stories of students who found an educational fit in their programs. The ideal scenario would allow students to access a wide variety of online course options designed after various models and at different levels. Research has just begun on identifying matches among individual students and specific courses.

Table 3. Common components of virtual school models

Component	Range of approaches	
Role of the teacher	The teacher is not involved in day-to-day instruction, but provides feedback on assignments.	The teacher is central to day-to-day instruction as well as providing feedback on performance.
Role of the parent	The parent is the primary instructor in daily lessons.	The parent is a support in addition to the teacher.
Role of a facilitator, mentor, tutor, site facilitator	There is no one in this role.	The person in this role works closely with the teacher and is in regular contact with students.
Student grouping	Students begin and progress through the course together so student-to-student interaction is maximized.	Students begin the course at any time and progress through the course at their own pace so flexibility is maximized.
Pace of learning activities	Activities are paced according to an academic calendar.	Activities are paced according to student needs.

Adapted from "Real Learning Happens in Virtual Schools," *Threshold* (Cavanaugh, 2008)

Professional development in online learning

Schools that are considering incorporating distance education into their school schedules should consider the professional development of their online and campus-based teachers. Online teachers must be competent in their content knowledge and pedagogical skill, as well as qualified to use effective methods of teaching content online and have experience in online learning.

Most online schools offer a "boot camp" to their teachers that provides an orientation with mentors and a period of guided initiation into online teaching. Large-scale adoption of distance education courses in K-12 schools will also require support from state teacher credentialing agencies, school accrediting agencies, and colleges of education to ensure that large numbers of teachers are prepared to teach online and that schools with significant proportions of online learning time meet accreditation standards. A few states have developed or adopted online teaching endorsements, and several university teacher education programs offer online teaching instruction and internship experiences. The content of preparation and professional development for online teachers has evolved over the past decade and is outlined in standards documents, such as the "National Standards for Quality Online Teaching," published by the International Association for K-12 Online Learning.

Because virtual schools have built a cadre of teachers who have been teaching online for up to 10 years, online teachers now represent all levels of the career ladder and have a range of professional skills. Many have become leaders and mentors through a systematic development process in which beginning teachers acquire new skills without a face-to-face network of colleagues.

Professional development for school support staff

Schools incorporating distance education should also ensure that their online providers have implemented a system of preparation, professional development, and career support for their support staff. Online teachers and students increasingly find support in school counselors and literacy coaches. These professionals work directly with students who need to improve their study skills, reading, or writing. Virtual schools have also begun to add media specialists as guides for students and teachers as the role of library media specialist has expanded to support school information and media needs. Student tutors, mentors, and facilitators also play a central role in assisting students in online courses. A successful online educational program depends on skilled technical support staff who interface between systems and users.

Structured communication between teachers and students

The interactions that happen within an online course are at the heart of online teaching and learning. Expanded learning time schools and initiatives should partner with quality online courses and providers that skillfully blend static digital resources, instructions, and assessments with dynamic interpersonal interactions that build high levels of student engagement and a sense of community.[30] Just as in classroom learning, online learning is enhanced when teachers are actively involved in the learning process, guiding the class through lessons and clarifying instructions for individual students. Frequent communica-

tion, feedback, and scheduled tutoring or skill checks improve student learning. Each of these interaction strategies contributes to the structure and communication that most K-12 learners need in the absence of meeting face-to-face at appointed times.

Leverage resources and support from community-based organizations

Any distance-learning model has opportunities for involving community-based organizations, particularly in ensuring that every student in a school has access to the technological infrastructure required in online courses. Low-cost computers, netbooks, and handheld devices are increasingly capable of supporting the interactive media used in online courses. Outside of school hours, community partners may open access to computer labs or provide network access for students and families.

Schools and labs can benefit from donations of used computers from government agencies and corporations.[31] Adequate technology hardware and network access are ongoing needs for a distance education program, as are course designers, instructors, and course facilitators or tutors. It is likely that community organizations have the expertise needed by a school that leverages K-12 distance education programs for its expanded day/year schedule.

Costs

The costs associated with incorporating a distance education program are considerable but not insurmountable. Many of the costs of online programs parallel those of on-ground programs: instructors, administrators, staff, professional development, curriculum and materials, assessment and evaluation, and data systems. Online programs have little to no cost for instructional facilities, transportation, and related staff. However, they must fund a substantial technology infrastructure including a course management system and support staff, as well as course design. A school that develops its own distance courses takes on all of these functions. A school that provides distance courses developed and taught by a virtual school takes responsibility for students' access to the site-based technology devices, infrastructure, and learning facilitators needed for student success.

Yet the value of adding distance courses increases when considering the extensive range of distance courses that are available. A survey of the directors of 20 virtual schools in 14 states found that the average annual cost for a full-time online student was $4,310 in 2008, while the U.S. average per-pupil expenditure in public schools was $9,138, as of 2006.[32] Only one of the virtual schools had a cost exceeding its state average. Other estimates place online programs as high as $8,300 per student per year.[33] These costs reflect an online student-teacher ratio similar to that found in classrooms, although some schools

pay teacher bonuses for more than the typical number of students in a course or for exceeding a target number of students who successfully complete a course.

Virtual school costs and funding models vary widely. Some virtual schools do not fund course development in-house, electing to purchase courses from other providers, thus benefiting from economy of scale. Many virtual schools function as course providers rather than as full-service schools. These schools fund teachers and other staff to manage the administrative and technical aspects of course delivery, but may not provide exceptional education teachers, school counselors, media specialists and resources, clubs and activities, and professional development services. Expanded learning time schools should weigh their need for support services in addition to courses when considering the costs of partnering with an online provider to offer online courses.

Thirty percent of school leaders in a 2008 national survey stated that online and blended courses are financially beneficial in their schools—a number that grew from 25 percent in 2007.[34] The same survey found that nearly 50 percent of schools had concerns over course development costs and the funding basis for online and blended courses.

Schools can realize a portion of the costs of adding online courses to the school day by eliminating the textbooks students take home for homework. The specifics of the flow of funding depend in part on whether schools and districts develop and deliver their own online courses, use online courses from a public virtual school, or franchise with a for-profit provider. Other methods of shifting costs will emerge, as we continue to rethink what schooling means.

Implications of Expanding Learning Time through Distance Education

A school reform effort of the magnitude of expanding learning time through distance education has widespread implications for students, teachers, and the social structures of schools, families, and communities. These social structures influence student school performance. This section outlines the potential benefits of distance education in an expanded learning time environment for student achievement, human capital, school designs, and communities, as well as the challenges associated with large-scale implementation of K-12 distance education programs.

Changes in teaching and learning

The nature of teaching changes when classes take place online. An online teacher focuses entirely on student accomplishment of course objectives, primarily via individual communication about student work within a mastery framework. Most virtual schools relieve teachers of course design duties by using teams of curriculum specialists, content experts, and instructional designers. This allows teachers, as learning specialists, to direct their professional attention to students and their families.

This learner-centered approach is central to the virtual school philosophy and the preparation of online teachers.[35] Learner-centered teaching in online courses has prompted online teachers to state that they feel a closer personal connection with their online students than with their face-to-face students because of the increased communication within an online course. Positive student-teacher relationships such as the ones fostered online are associated with positive student outcomes, including critical thinking, motivation, and dropout prevention.[36] Principles of learner-centered education are strongly aligned with the characteristics of effective interactive online courses.[37]

Guided practice is essential for student learning. It is not expected that students will leave high school as an expert in any subject. Yet high school graduates must be expert learners in order to be successful in further education, in a series of careers, and in the demands of college and the workforce. Students can become expert learners in the many academic and practical domains they will need to master only with extensive practice under the

guidance of professional educators. In fact, researchers estimate that students need 10,000 hours of guided practice to achieve expertise.[38] There are approximately 800 annual school instructional hours a year in American schools,[39] which means it would take 12.5 years for students to participate in 10,000 hours of schooling, given no shortfall of skills during the summer. Unfortunately, summer shortfall accounts for a large portion of the achievement gap within the United States.[40]

An online teacher's immediate, personalized, and continual feedback over an expanded school year is an optimal way to increase the time K-12 students have to practice becoming expert learners, particularly in communities with high economic need. Because intensive practice is most effective with periods of rest, expanding the school day and year would allow enrichment activities and recreation time to be added to the schedule, making for a healthier school experience. Taking some of their courses online allows students access to both a broader array of courses suited to their developmental levels and opportunities to participate in associated experiential learning opportunities such as service learning, study travel, and apprenticeships.

Teachers' work lives would change dramatically within a reform program that integrates distance education into an expanded school day or year. Teachers can have increased flexibility in their teaching schedules. Some can opt for a shorter workday through job sharing with other teachers. Some can choose a work schedule that is solely classroom-based; others may prefer to teach completely online; and yet others can choose a blended schedule to allow them to teach courses online that could not be sustained by the student population in their on-ground schools.

Teacher retention in the profession will likely increase once teachers have the ability to select the work style most compatible with their strengths and family situations; schedule and salary are common reasons given for teacher attrition.[41] A teacher working an expanded day can be compensated with a higher salary rate. As a result, new teacher mentoring, teacher networks, and collaboration—all of which are associated with teacher retention and are current hallmarks of effective virtual schools—will be more attainable.[42]

Schools have increased flexibility in scheduling students in classrooms and courses when online courses are available. All models where students spend part of the day at the school and the rest of the day learning online from an alternate location allow school buildings to accommodate higher numbers of students during the school day, potentially making space for adult learning programs on site. In addition to expanded course offerings, students could also have increased access to online guidance counselors, library media specialists, and tutors. Full-featured virtual schools succeed in offering well-rounded educational experiences involving support staff. Both face-to-face and online professionals can be available to students up to 24 hours per day through a consortium of on-ground schools that share the staff of a virtual school.

Changes in school leadership and management

Online learning often increases the number of courses and teachers in a school, creating more student performance data for schools to manage. Schools will need systems for learning about student and teacher performance in the absence of classroom observations and walk-throughs. Virtual schools and their vendor partners have developed sophisticated student data systems that monitor student course behavior and content mastery, teacher contacts with students and parents, and detailed demographic data, in some cases at the state level. Centralized systems like these could ease the data management burden of small schools and districts, especially with mobile student populations. The data maintained in these systems are often used proactively for diagnostic and school improvement purposes.[43]

The magnitude of data captured in online course management systems, school data systems, and centralized systems such as the Virtual Schools Clearinghouse at the University of Florida enable detailed analysis. These systems can reveal student and teacher success factors so that school leaders can establish early warning systems. If data analysis reveals, for example, that student success is associated with a threshold amount of time in a class, clicks on a class website, or teacher contacts with parents, then the system can alert the teacher or school leader immediately in cases where the threshold is not met. The school can also tailor professional development and parent education efforts to build on "high-yield" practices for the benefit of students.

Changes for families and communities

Homework done after school informally expands learning time, but doing unguided schoolwork gives little benefit to struggling students who need the most practice.[44] Reports are mixed on the effects of homework on learning. Expanding learning time through teacher-facilitated courses is likely to have a more positive influence on learning. When online courses replace homework time in an expanded learning time school, family involvement opportunities shift from home-based to school-based—a form of involvement that is associated with student skill and motivation development.[45]

The cost of a college education can also go down for students who take online dual enrollment and Advanced Placement courses. Significantly increased K-12 learning will better prepare students to enter college, avoiding the need for remedial courses in many cases. Before the availability of distance courses, access to advanced high school courses depended on whether a school has a course enrollment minimum and whether it could hire a qualified teacher. Large virtual schools now offer extensive catalogs of advanced and specialized courses such as Web Design and AP Computer Science; AP Art History; world languages such as Mandarin and Arabic; and AP Microeconomics. These opportunities are important equalizers for students in small, rural, and underfunded schools.

Depending on its design, a high-quality distance education program in each school could also assist the surrounding community. For example, school facilities could flexibly allow space for adult education programs if students and teachers spend part of the day participating in online classes outside of the school building. Parents and other adults who did not complete high school could increase their employability if GED courses were included in the distance education program. The workforce and economy could expand as children spend longer periods in school, requiring parents to spend less time and money on after-school and summer childcare. And new models would create new jobs for online teachers and school site course facilitators.

Conclusion

Virtual schools have worked for more than 1 million American K-12 students. Online courses already serve students on a broad scale in countries such as Singapore and South Korea. These are countries that use online courses as one of the strategies to offer longer school days and longer school years. Students in these countries outperform American students in Programme for International Student Assessment and Trends in Mathematics and Science tests.[46] They are a required part of the curriculum in some areas of the United States because they are effective and because they are a standard approach to learning when students leave high school for higher education and career development. Online courses combine flexibility, personalization, interaction, independence, rich media, and proven materials. They connect teachers and learners across the full scope of cultures.

This paper touches the surface of the complexities and possibilities of expanding school learning time through distance education. A deeper examination and more research are needed as schools and districts move from blending online experiences in existing classrooms to adding full online courses to their catalogs. More comprehensive and standardized data from virtual schools will help to clarify this picture.

Promising lines for future research in K-12 distance education for expanding learning time include studies of effectiveness in:

- Blended learning models and practices
- 1-to-1 computing models and practices
- School administration and leadership practices
- Funding and cost models
- Matching students with the optimal learning environment
- Professional development and teacher education programs
- Systems for analysis and display of data to school staff, parents, and students in order to answer questions about both what is happening in the school and why

Ultimately, longitudinal investigation of fundamental learning factors within schools offering online and classroom-based courses will give insight into the optimal combinations of student needs, course structure, and support services. This knowledge will enable schools to recommend course designs and scaffolds that are appropriate for individual students.

Educators and school leaders can begin an expanded learning time program very quickly with distance education courses. Such courses are available at no cost or low cost in many school districts and states. Students can register for online courses:

- In public virtual school programs operated in their school district
- In public virtual schools operated in their state or other states
- In universities and colleges
- In the Virtual High School, once their school joins the consortium
- In private virtual schools

A pivotal early decision for a school interested in forming its own expanded learning time program through distance education is whether it should develop and teach courses in-house at the beginning. This option is sensible for a large school or district with a sizable pool of technical and instructional expertise, especially if the program is likely to grow or is intended to serve a unique student population. Most schools and districts rely on course vendors or franchise courses from established virtual schools to launch new programs and build expertise. Often the vendors provide professional development and apprenticeships to teachers, leaders, course designers, course facilitators and other local staff.

About the author

Dr. Cathy Cavanaugh is Associate Professor of Educational Technology in the School of Teaching and Learning at the University of Florida in Gainesville. Her work focuses on identifying applications of information and communication technology that enhance teaching and learning. Dr. Cavanaugh has worked with virtual schools, school districts, and education agencies in several states and countries. She has taught educators and leaders at the University of North Florida, University of South Florida, Rollins College and Furman University. She served as co-director of the Northeast Florida Science, Technology and Mathematics Center, as Assistant Director of the Florida Center for Instructional Technology, and as a classroom teacher in Florida and the Caribbean. She has a B.A. in education from the University of the Virgin Islands, a M.Ed. from the University of Central Florida, and a Ph.D. in curriculum and instruction from the University of South Florida specializing in distance education.

Acknowledgments

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