K-12 Online Learning: A Literature Review

Research conducted by Insightlink for NAIS

Washington, DC
April 2010
Executive Summary

There can be no doubt that technology – including the ability to learn online – is having a profound impact on education in the 21st Century. As is always the case in the early stages of important innovations, there is an urgent need for independent schools to carefully define and evaluate the advantages and risks that new technologies are having on education both now and in the near future.

Starting with a “big picture” approach, independent schools should already have plans and policies in place for incorporating technology into the classroom setting. Today’s K-12 students are very comfortable and proficient with technology and independent schools should be leveraging this ability at all grade levels. The appropriate use of technology in independent school classrooms will not only help ensure that independent schools remain current in the eyes of both students and parents, it will also help independent schools prepare their students to compete effectively in an online global environment. There is also evidence that the use of technology in classroom settings can increase academic performance.

As one component of the use of technology within independent schools, deciding on the role of fully online learning presents a more interesting challenge. On the one hand, fully online learning offers advantages to both schools and students that extend the ability to deliver educational content outside of the traditional classroom. These advantages include providing independent schools with the opportunity to offer a substantially more enriched choice of courses, providing students with an approach to learning that is more developed in postsecondary institutions, and giving students the opportunity to participate in self-directed learning, with the possibility of achieving better outcomes than in traditional classrooms. In particular, fully online courses represent a means by which independent schools can more fully prepare students for the college experience.

This review of the literature on K-12 online learning suggests that the penetration and use of fully online learning is at a very early stage of development and, so far, the market appears to be driven more by the availability of the technology as a new form of distance learning and as a way to fulfill specific needs than as a strategic response to previously unmet pent-up demand.

Although much of the literature cites recent and continuing growth in fully online learning, even the most optimistic expectations are that just 7 percent of the total K-12 population in 2014 will be taking all of their courses online, while an additional 13 percent are anticipated to be taking at least some of their courses online.

Assuming that these projections are reasonably accurate, independent school leaders should be asking themselves what their share of the fully online component of K-12 education should be, as well as what role they should play in the somewhat larger field of hybrid/blended online learning.
To help plan for fully online courses, independent schools should undertake the following analysis:

1. Determine the characteristics of the student population that will be best served by fully online learning – including both demographic and psychographic characteristics – and estimate the total size of that population.
2. Estimate the degree to which independent schools already serve this population and the size of the opportunity if independent schools were to reach out to this population. In other words, will the growth of fully online courses mean that independent schools will be able to better meet the needs of their core constituency or will they be able to attract new constituency groups that they do not currently serve?
3. Assess what resources would be required to fully serve the needs of either of these constituencies.

Most importantly, independent schools must undertake this analysis within the context of each school’s stated mission, vision, and values. It is essential that any initiative to offer fully online courses must be congruent with the school’s intended positioning.

These estimates of the market potential available to independent schools should then help schools choose a course of action regarding the role of fully online and hybrid/blended online learning in both the short- and medium-term.

A second key consideration for independent schools is how to assess and monitor the quality of any online courses that are offered through the school, particularly in light of independent schools’ express commitment to high standards in education. The quality of both the educational experience and the outcome are critical considerations in choosing from among existing courses offered by outside vendors, working collaboratively with other independent schools to create shared courses or developing online courses on a school-by-school basis.

In summary, independent schools should approach the prospect of online learning with open minds as to the opportunities available combined with a clear and careful articulation of the objectives to be achieved by offering education in this exciting new format.
K-12 Online Learning: A Literature Review

National Association of Independent Schools March 2010

Background

The National Association of Independent Schools (NAIS) asked its research partner, Insightlink, to explore the current state of K-12 online learning in the U.S., with particular emphasis on the apparent opportunities and threats for independent schools. The scope of this research was informed by the work, conversations, and insights of the NAIS 21st Century Curriculum/Technology Task Force.

Methodology

To produce this summary report, Insightlink conducted an online search and review of relevant research and articles about K-12 online learning specifically, supplemented by information about online learning in general.

Key Findings

Definitions

As a new and growing field, “online learning” can be defined in a variety of ways and consistent terminology is still being developed. As the 2009 Keeping Pace with K-12 Online Learning report notes,

The terms “online learning,” “virtual learning,” and “elearning” are interchangeable. Similarly, other terms including cyberschools and electronic courses do not have generally understood meanings. All of these terms refer to some sort of Internet- or computer-based instruction, but two courses that are both called “online” may in fact be very different in terms of production values, level of teacher involvement, instructional technology, and other factors.¹

NAIS’s working definition of online learning is “any course or program conducted outside of the physical classroom using Internet-based technology for instruction.” A further distinction is then made between instruction that is “fully online,” meaning that at least 80 percent of learning is conducted online at a distance with little or no face-to-face component, and “hybrid” or “blended” learning, which combines online learning with face-to-face instruction.

For this review, the concept of learning “at a distance” is critical to the definition of online learning. As the North Central Regional Educational Laboratory (NCREL) notes in

Online learning is a form of distance learning – formal study in which teacher and learner are separate in time and space. ²

In other words, this differentiation is intended to exclude the use of Internet-based technologies in classrooms or any other non-school use of educational online technologies.

A second key distinction is whether the online learning is:

- Full time, meaning that students enroll and earn credit issued by the online school, or
- Supplemental, meaning that students are enrolled in a “traditional” school but supplement their learning with online courses or programs.

To the degree possible, these distinctions will be maintained through this literature analysis.

The 2009 Keeping Pace report includes the following summary of the various characteristics and components of online learning³:


³Keeping Pace with K-12 Online Learning, 2009, page 16
The Sloan Consortium’s ongoing series of reports on online education in the U.S. uses definitions that vary depending on the amount of content delivered through online technology:

<table>
<thead>
<tr>
<th>Proportion of Content Delivered Online</th>
<th>Type of Course</th>
<th>Typical Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>Traditional</td>
<td>Course with no online technology used — content is delivered in writing or orally.</td>
</tr>
<tr>
<td>1 to 29%</td>
<td>Web Facilitated</td>
<td>Course that uses web-based technology to facilitate what is essentially a face-to-face course, may use a course management system (CMS) or web pages to post the syllabus and assignments.</td>
</tr>
<tr>
<td>30 to 79%</td>
<td>Blended/Hybrid</td>
<td>Course that blends online and face-to-face delivery. Substantial proportion of the content is delivered online, typically uses online discussions, and typically has a reduced number of face-to-face meetings.</td>
</tr>
<tr>
<td>80+%</td>
<td>Online</td>
<td>A course where most or all of the content is delivered online. Typically have no face-to-face meetings.</td>
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</table>

**Market Size: Enrollments**

There is a general consensus throughout the literature that online learning in all of its forms is growing steadily. However, in order for independent schools to assess both the opportunities and threats raised by online learning, it is important to have a reasonable estimate of current and projected market size for online learning, ideally within the context of the overall K-12 school population.

To set the stage for estimating the incidences of K-12 online learning, the National Center for Education Statistics (NCES) provides the following estimates for the total K-12 school population:

<table>
<thead>
<tr>
<th>Type of Schooling</th>
<th>Estimated Population</th>
<th>Share of Total K-12 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public School Enrollment</td>
<td>49.8 million</td>
<td>87.1%</td>
</tr>
<tr>
<td>Private School Enrollment</td>
<td>5.9 million</td>
<td>10.3%</td>
</tr>
<tr>
<td>Homeschooled Students</td>
<td>1.5 million</td>
<td>2.6%</td>
</tr>
<tr>
<td>Total population</td>
<td>57.2 million</td>
<td>100%</td>
</tr>
</tbody>
</table>


At this time, there is no national protocol or tool for measuring online enrollment among K-12 students. As a result, various proxies and estimates are used as substitutes. In terms of coverage by state, the 2009 *Keeping Pace* report notes that:

> **Online learning opportunities have spread into more states than ever before. Keeping Pace now counts 45 of the 50 states (plus Washington D.C.) as having a state virtual school or online initiative, full-time online schools, or both.**

This report also highlights the difficulty inherent in estimating the current level of participation in K-12 online learning:

> **First, there is no agreed-upon definition of an online course.** Therefore, any estimate has to define the types of courses and enrollments that are being included in the count.

> **Second, different types of programs count students differently.** Supplemental programs typically count course enrollments (one student taking one semester-long course), while fulltime schools typically count student enrollments (one student enrolled full time). Different types of programs are often reported together, leading to confusion about the metric being used. If a supplemental program reports the same number of unique students as a full-time school, the total number of online courses is much higher in the full-time school.

> **Third, most states are not counting or reporting online students in any formal way.** There are far more states with no counting and reporting than states that have a count of online students. Within the states that do provide a count, the first challenge in this list (no commonly agreed-upon definitions) comes into play.

Within these limitations, the *Keeping Pace* report estimates current online enrollment as follows:

- 175,000 students attending full-time online schools.
- 320,000 course enrollments (one student taking one semester long course) in state virtual schools.

With an estimated total of 495,000 students enrolled in these types of online programs, this represents a very small percentage – just 0.9 percent – of the current K-12 student population.

However, these estimates do not include other types of online course offerings, such as single-district online programs, consortium online programs, and post-secondary online programs that may be “tied to dual-credit for students enrolled in a traditional high school.”

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6 *Keeping Pace with K-12 Online Learning*, 2009, page 8  
7 *Keeping Pace with K-12 Online Learning*, 2009, page 19  
8 *Keeping Pace with K-12 Online Learning*, 2009, page 18
In January 2009, the Sloan Consortium issued a report called *K-12 Online Learning: A 2008 Follow-Up of the Survey of U.S. School District Administrators* and one of the goals of this study was to estimate the number of K-12 public school students enrolled in online learning. The results suggest that there is widespread availability of online programs throughout public school districts but moderate levels of actual enrollment. In terms of availability among responding public school districts...

75 percent had one or more students enrolled in a fully online or blended course.

70 percent had one or more students enrolled in a fully online course.

41 percent had one or more students enrolled in a blended course.

*These percentages represent an increase of approximately 10 percent since 2005-2006.*

As for enrollment, the Consortium extrapolated its survey findings to conclude that “the overall number of K-12 students engaged in online courses in 2007-2008 is estimated at 1,030,000. This represents a 47% increase since 2005-2006.” Overall, though, this level of student participation in online learning represents just 2 percent of current public school enrollment.

This study also projects that “it is conceivable that by 2016 online enrollments could reach between 5 and 6 million K-12 (mostly high school) students.” Based on NCES’s future projection of public school enrollment for 2010 of 52.9 million, the estimate of online enrollment would account for between 10 percent and 11 percent of public school students.

Ambient Insight’s estimate of the number of K-12 students taking some form of online schooling (which it defines as “self-paced eLearning”) is somewhat higher than the Sloan Consortium estimate. Ambient’s estimates are that 450,000 K-12 students currently attend virtual schools or “cyber” charter schools full time and 1.75 million take some of their courses online, compared with 50.03 million who take all of their courses in physical classrooms. They also include a projection of these numbers for 2014:

<table>
<thead>
<tr>
<th>Type of Schooling</th>
<th>2009 Estimate</th>
<th>2014 Projection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fulltime online learning</td>
<td>0.45 million</td>
<td>0.9%</td>
</tr>
<tr>
<td>Some online learning</td>
<td>1.75 million</td>
<td>3.3%</td>
</tr>
<tr>
<td>Fulltime classroom learning</td>
<td>50.03 million</td>
<td>95.8%</td>
</tr>
<tr>
<td>Total population</td>
<td>52.23 million</td>
<td>100%</td>
</tr>
</tbody>
</table>


*K-12 Online Learning, 2009, page 1*

Further refining this result, the estimates suggest that online enrollment is skewed more strongly to high school students than to elementary or middle school students. This difference would indicate that the incidence of online learning experience is somewhat larger among high school students specifically.

There are indications that online learning has reached a larger share within postsecondary institutions. For example, in 2005, *A Synthesis of New Research on K-12 Online Learning* reported that:

> Online learning is more widespread in postsecondary education, where an estimated 1.9 million students enrolled in at least one online course in 2003 (Allen & Seaman, 2004). This number represents almost 12 percent of the 16.4 million students enrolled in postsecondary education that year (Snyder, Tan, & Hoffman, 2004).

On a similar note, in 2005, the North American Council for Online Learning reported that:

> E-learning is already a major driver for education and training beyond K-12 in higher education, employee training and lifelong learning. In higher education, the Sloan Consortium reported that 2.5 million students enrolled in at least one class online in 2004, equivalent to 11% of all students in accredited degree-granting institutions. Growth in online higher education programs steadily increases by 400,000 students annually.

The Sloan Consortium continues to report strong growth in postsecondary online enrollment since the 2004 estimate – “over twenty percent of all U.S. higher education students were taking at least one online course in the fall of 2007” – with the trends in growth as follows:

<table>
<thead>
<tr>
<th>Postsecondary Education</th>
<th>Online Enrollment as a Share of Total Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>9.6%</td>
</tr>
<tr>
<td>2003</td>
<td>11.7%</td>
</tr>
<tr>
<td>2004</td>
<td>13.5%</td>
</tr>
<tr>
<td>2005</td>
<td>18.2%</td>
</tr>
<tr>
<td>2006</td>
<td>19.6%</td>
</tr>
<tr>
<td>2007</td>
<td>21.9%</td>
</tr>
</tbody>
</table>

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12 *A Synthesis of New Research on K-12 Online Learning*, page 6
Market Size: Value and Course Costs

There appear to be few estimates of the market value of K-12 online learning. According to The International Association for K-12 Online Learning (iNACOL)’s Fast Facts About Online Learning 2009,

"K-12 online learning is a new field consisting of an estimated $300 million market, which is growing at an estimated annual pace of 30% annually."

This estimate is a projected calculation based on “the original estimate from the Peak Group of $50 million in 2000.” There also appears to be limited data on the costs associated with online courses. Keeping Pace notes that the cost to attend Stanford University’s EPGY (Education Program for Gifted Youth) “is typical of a high-end private school with full-time students (4 or more courses) charged $13,000 per year.”

A study by Augenblick, Palaich, & Associates in 2006 examined issues relating to costs and funding of state-led virtual schools. The cost results were divided into two categories – start-up costs and ongoing costs. For start-up costs, the results suggested that “a new state-led supplemental program, designed to serve approximately 500 students full time equivalents, or provide 3,000 units of instruction in year one, will require about $1.6 million to adequately fund start-up activities before providing instruction.” In terms of operating costs, the report concludes that:

Post-startup operating costs are heavily dependent on the variables discussed above [NOTE: These factors are: Program governance, teacher salaries, student-teacher ratio, student population, degree of at-home vs. on-site computing, course completion rate, quality assurance, research and development, program size and economies of scale and program growth]. The most significant variation in costs depend on where students take online courses (from home or school) and the characteristics of the students served (number of special needs students and the level of responsibility the school has for serving such students).

For a full-time program, results from the panel suggest that costs range from about $7200 to about $8300 per FTE, again dependent on the variables discussed above. Full-time programs can be more expensive than those serving students on a supplemental basis because these schools are typically responsible for special needs students and for adhering to state and federal accountability requirements (including granting credits, testing students, making AYP, etc.). In addition, local virtual schools are more likely than state virtual schools to provide computers and Internet connectivity for their students, which can result in higher costs per pupil.

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16 Email from Susan Patrick of iNACOL, 2/18/2010.
17 Keeping Pace with K-12 Online Learning. 2009, page 28
19 Costs and Funding of Virtual Schools, 2006, pages 12-13
In a 2006 article called “The Virtual Revolution: Understanding Online Schools” by Randall Greenway and Gregg Vanourek, the authors note that …

*Developing a high-quality virtual-learning program can be costly, requiring sizable capital expenditures on computers and servers, sophisticated instructional design (the orchestration of different media--such as online, offline, images, sound--into compelling and effective instructional units), content and course-management systems (computer systems for organizing and facilitating collaboration on documents and courses), course-authoring platforms (computer frameworks that allow educators to 'post' their courses onto the Internet), and beta and usability testing (publishing test versions of new programs to eliminate the 'bugs' and ensure ease of use).*

In contrast to the sizeable costs of developing online programs “from scratch,” the use of existing online programs is clearly more cost-effective. The U.S. Department of Education’s report, *Connecting Students to Advanced Courses Online*, includes a summary of the costs for supplemental online courses from six different providers. The reported costs range from $130 per semester course at the low end to $1,740 on the high end, with most programs falling between $200 and $500 per course.

The purpose of this review was to give public school district and school decision-makers assistance in assessing online opportunities to give their students greater access to advanced course work. To that end, the six providers were selected because they best met five basic criteria set for inclusion in the review.

In a 2008 article by Clayton Christensen and Michael Horn called “How Do We Transform Our Schools?,” the authors use a logarithmic approach to predict that “in about six years 10 percent of all courses will be computer-based, and by 2019 about 50 percent of courses will be delivered online.” They cite cost considerations among the driving forces behind this innovation:

*This is happening because computer-based learning possesses technological and economic advantages compared to the traditional school model. Economically, while estimates vary depending on circumstances, many providers have costs that range from $200 to $600 per course, which is less expensive than the current schooling model.*

These cost estimates are similar to those cited in *Connecting Students to Advanced Courses Online*.

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23 “How Do We Transform Our Schools?”, page 17
Benefits of Online Learning

In 2006, the U.S. Department of Education undertook a meta-analysis and review of online learning studies and concluded that:

1. There are few published studies contrasting online and face-to-face learning conditions for K-12 learning specifically, meaning that the implications for K-12 learning should be treated with caution.

2. Among older learners, “students who took all or part of their class online performed better, on average, than those taking the same course through traditional face-to-face instruction.” They also noted, though, that the differences in performance may not be linked entirely to differences in the delivery of instruction.

3. Blended instruction (i.e., that combining online and face-to-face instruction) has a larger advantage relative to traditional classroom instruction than does fully online instruction. Nevertheless, fully online learning “appears to offer a modest advantage over conventional classroom instruction.”

4. Online learning approaches appear to be effective across a variety of content (both academic and professional studies) and student types (undergraduate students, graduates and professionals).

This analysis also concluded that online learning can be enhanced by giving students control of their interactions with media and encouraging them to reflect on the material being taught.

In 2005, NCREL conducted the K-12 Online Learning Research Initiative to “address the evident need for new quantitative research on K-12 online learning.” Eight research projects were reviewed in an effort to uncover patterns, themes, and categories relating to K-12 online learning. This summary identified a number of consistent themes and offered “new evidence of both concern and promise within the K-12 online learning context in the United States.” To start, the analysis confirmed that a number of complex factors have an influence over student academic performance in online courses, including:

1. Program effectiveness
2. The socioeconomic status of the students
3. School climate
4. Parental involvement
5. Learner characteristics


Evaluation of Evidence-Based Practices in Online Learning, 2009

A Synthesis of New Research on K-12 Online Learning, page 18

A Synthesis of New Research on K-12 Online Learning, page 54

A Synthesis of New Research on K-12 Online Learning, page 54
Importantly, “many of the eight studies offered evidence that student academic performance increased in online programs and schools,” and that “more communication, more feedback, and more student-teacher interaction have an apparently positive effect on student academic performance.”

However, these studies also reiterated previous findings that successful virtual school participants share particular characteristics, with the recommendation that “students who are being selected for virtual schools should demonstrate ‘the ability to learn independently, effective written communication skills, self-motivation and discipline, and efficient time management skills.’” Similarly, about two-thirds of public school district administrators agree that “students need more discipline to succeed in an online course than in a face-to-face course.”

Finally, this research synthesis raises the important question of the relative impact on student performance between fully online and “hybrid” learning:

Simply stated, this question asks whether purely online instructional delivery of online learning, such as is characterized by educational programs conducted in virtual or online schools (or cyberschools) might show evidence of greater (or lesser) academic performance than online courses offered within the educational program offered in a ‘traditional’ high school.

Two different NCREL meta-analyses suggest that the use of technology in classroom settings (i.e. “hybrid learning”) has a measurably positive impact on academic performance whereas fully online learning showed essentially a zero effect.

Although NCREL calls for more research on this key issue, this specific question – the relative efficacy of hybrid versus fully online learning – should be carefully considered as independent schools plan their response to the ongoing development of online learning.

In 2008, Interactive Educational Systems Design (IESD), Inc. conducted a research study to address the concern that students enrolled in online public schools may suffer from a lack of opportunities for socialization and, in turn, may fail to develop important social skills. The report concludes that:

In general, the results of this evaluation suggest that typical, mainstream students enrolled in full-time, online public schools—i.e., students without the kinds of special needs that might result in pulling them out of regular public school classrooms—are either superior to or not significantly different than students enrolled in traditional...
public schools with respect to social skills and problem behaviors. There is also preliminary evidence suggesting that students enrolled in full-time, online public schools might have an advantage in their social skills development if they are highly engaged in activities outside of the school day—including activities involving peer interaction and activities not involving peer interaction. Furthermore, the results indicate parent perceptions of important benefits to online public schooling, related to academics and other aspects of their children’s education.\(^{35}\)

In their 2006 article entitled *The Virtual Revolution: Understanding Online Schools*, Randall Greenway and Gregg Vanourek summarize the benefits of online learning as follows:

> Though virtual schools, like traditional schools, have a central office, administrators, teachers, curriculum, daily attendance, grades, report cards, professional development, parent conferences, special-education, health services, field trips--even school board meetings (though often conducted remotely)--there are important differences from their nonvirtual cousins: greater dependence on technology; more individualized, interactive, and self-paced instruction; complicated logistical issues due to the dispersion of students; different kinds of socialization (some face-to-face, some virtual); no snow days.  

\(^{36}\)

**Motivations for Offering Online Learning**

Much of the original impetus behind online learning was to address concerns about equity and access to education.\(^{37}\)

The Center for Digital Education reports that:

> Twenty-seven states indicate that online learning is in their strategy for school reform. Within these states, online programs are used to enhance the curriculum offered to students, increase student access, and address teacher shortages or overcrowded classrooms.

> Online programs have a major impact in rural areas. In the past, it has been difficult for districts to find qualified teachers for specific subjects such as advanced mathematics or science courses. Online courses have made it possible for rural districts to find qualified teachers, allowing students to take courses they may otherwise not be able to access.  

\(^{38}\)


\(^{36}\)The Virtual Revolution: Understanding Online Schools, page 38

\(^{37}\)A Synthesis of New Research on K-12 Online Learning, page 8

Online learning appears to be especially effective at meeting specific student needs:

1. Students who are homebound
2. Students with learning disabilities
3. Gifted and talented learners
4. Adjudicated youth in institutions
5. Homeschooled students

There is additional evidence that corroborates the role of online learning for homeschooled students. In 2003, the National Center for Education Statistics report called *Homeschooling in the United States: 2003* concluded that 41 percent of homeschooled students were involved in some kind of distance learning and, of those students involved in distance learning, slightly more than 20 percent were gaining instruction through television, video, or radio; nearly 19.5 percent were instructed through the Internet, email, or other use of the web; and slightly more than 15 percent were instructed using the United States Postal Service (USPS).

The impetus for choosing online learning can include both acceleration and remediation. As Randall Greenway and Gregg Vanourek note:

> Virtual schools appeal to a wide array of students, attracting children from both ends of the achievement spectrum. Self-paced study allows struggling students to catch up without a classroom full of distractions and enables advanced students to accelerate their work according to their own abilities and without bogging them down in "busy-work." Families choose virtual schools for many reasons: curriculum quality or focus, individualized instruction, flexible scheduling, interest in technology, and more.

> Most students in virtual schools transfer into them from traditional public schools, but many home-school students transfer into them to connect with other learners and professional staff or to access the credibility of accredited programs. Students with intensive acting or athletics regimens and children of high-mobility military families are served well by the flexibility. Urban parents may want to address safety or overcrowding concerns, while rural parents may seek advanced or specialized academic offerings not available locally. (According to the College Board, about 43 percent of U.S. high schools, many of them rural, do not offer Advanced Placement courses.)

These results are corroborated by the 2009 K-12 Online Learning survey among public school administrators who consistently assign the highest importance to:

1. Meeting the needs of specific groups of students
2. Offering courses not otherwise available at the school
3. Offering Advanced Placement or college-level courses

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39 A Synthesis of New Research on K-12 Online Learning, page 57
41 The Virtual Revolution: Understanding Online Schools, pages 39-40
4. Permitting students who failed a course to take it again 
5. Reducing scheduling conflicts for students

To get the perspective of parents, the 2009 IESD report on Social Skills of Mainstream Students in Full-Time, Online Public Schools asked parents their reasons for choosing full-time, online public schools for their children:

In general, the most frequently identified parent reasons for choosing online public schools were about achieving positive outcomes related to parent/family involvement in learning, as opposed to “fixing” problems with either the child or the school system. Each of the following reasons was chosen from a list by more than 60% of the responding parents:

- A home-based environment, but with the active support and structure of the public school system (e.g., books and materials, certified teachers)
- A learning environment consistent with our family values
- More involvement in our child’s education

The study then goes on to note a concern among these parents:

However, a sizeable minority—more than one-third of the responding parents—expressed child-focused concerns related to differentiating instruction to meet specific student needs. Each of the following child concerns was chosen from a list by at least one-third of the parents:

- Needs a more challenging/higher quality curriculum
- Does better with a more self-directed approach to learning
- Needs an individualized approach

The results reported in Learning in the 21st Century: 2009 Trends Update highlight similar benefits and motivations from the perspective of students themselves, with “earning college credit” at the top of the list for high school students and “getting extra help in a subject” as the lead driver for both middle school and elementary school students.

Teacher Training

In 2005, A Synthesis of New Research on K-12 Online Learning concluded that:

Evidence on the extent of training for online teachers is anecdotal. It is likely that less than 1 percent of all teachers nationwide are trained as online teachers. The intensity, duration, and quality of staff development for online teachers appear to vary significantly.

42 K-12 Online Learning, page 11
45 A Synthesis of New Research on K-12 Online Learning, page 8
This analysis then stresses the pressing need for professional development in online learning, with their recommendations for improving staff development consisting of:

*Adding more technology training on how to use the materials and equipment; customizing staff development, depending on the teacher needs; adding more lab activities; including staff development on test development; providing more understanding of how to use learning management systems; and differentiating staff development for new and returning teachers.*

There was wide agreement among the responding faculty that online instruction does require more effort. This was especially true among those who had created an online course (where over 80 percent said it took more effort to develop an online course than a face-to-face one) – but the result was true for teaching online, where over 60 percent thought it takes more effort than to teach a face-to-face course.

According to the report, *Going Virtual! Unique Needs and Challenges of K-12 Online Teachers*, the most important professional development needs according to online teachers from virtual schools, supplemental online programs, and brick and mortar programs are as follows:

**Critical professional development needs:**
Professional development needs rated as very important (rating of 4 on scale of 1-4) included use of communication technologies (74%), time management strategies (62%), risks of academic dishonesty to learners (60%), and student internet safety (60%).

**Other professional development needs:**
We asked online teachers to identify themselves by 1) model of program, including virtual schools, supplemental programs, and brick and mortar online programs, and 2) years of teaching experience. Results below reflect comparisons among these groups:

**Technology tools:** Professional development in Web 2.0 technologies is reported as less important by virtual school teachers (46%), and is rated higher by brick and mortar online teachers (85%).

**Facilitation:** Highly rated facilitation topics included: enable student autonomy, independence, and responsibility for lesson mastery (over 90%), time management strategies (88-94%), and alternative interventions to address varied learning needs (81-92%).

**Online content development:** More online teachers in brick and mortar online programs are required to develop content (67%) when compared to teachers in supplemental programs (44%) or virtual schools (37%). Over 90% of respondents reported maintaining accuracy and currency of course content as important to very important.

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*46 A Synthesis of New Research on K-12 Online Learning, page 61
Digital etiquette: 100% of online teachers in brick and mortar programs rated risks of academic dishonesty to learners as important to very important.

Assessment: Two professional development topics in the survey, peer review (58% or lower) and student self-evaluation (79% or lower), received the lowest consistent ratings of all professional development needs in the survey.

Networking/community building: The importance of professional development in networking and community building had the lowest ratings among all categories in the survey.

Leadership: Ninety-one percent of virtual school teachers rated the professional development need of management tasks as important to very important.

Special needs: Virtual school teachers reported higher needs in modify, customize, and/or personalize activities (90%), intervention and/or enrichment (91%), and in team teaching (70%). Only 33% of supplemental and brick and mortar teachers reported team teaching as an important training topic.

A review by iNACOL on the factors that determine the effectiveness of K-12 online learning highlighted the following key points:

1. Highly effective online teachers are the result of an effective instructional delivery model aligned with the selection and preparation of effective teachers.
2. Researchers have determined that highly effective virtual teaching requires a highly interactive classroom …. Distance-learning research indicates that this instructor-learner interaction is the most important ingredient in student success.
3. Virtual teachers must be able to orchestrate arrays of opportunities for students, to continually learn, to model effective practice, to provide guidance and leadership, to set standards and help students assess themselves, to intervene when necessary, and to maximize the potential of every student. In spite of observations that virtual high school students engage in self-directed learning, teachers are still needed to carefully direct instruction.
4. An effective teacher can be identified by the ability to make individual connections with students. Such an effective teacher would be seen as a motivator, a guide, a mentor, and a listener.
5. Highly facilitated instruction also suggests being highly responsive. Effective online teaching practices must include a fast turn-around to student and parent inquiries.
6. Online teachers must become adept at using web-based technologies to offer students activities that make use of the web's powerful tools for collaborative learning. Online learning environments that are designed to use the many

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available collaborative communication tools can offer a more active, constructive, and cooperative experience than classroom learning.

7. Regardless of whether online instruction is delivered synchronously or asynchronously as an instructional model, online educators must be trained in both. Synchronous instruction brings teacher and students together simultaneously in virtual spaces. This implies that virtual teachers need to become skillful at using chat rooms and collaborative software. Asynchronous instruction may be delivered without any specific timetable, requiring teachers to become knowledgeable about offering postings online and discussion boards. 49

Major Providers of Online and Blended Learning

According to public school district administrators, the major providers of online courses are:

1. State virtual schools, whether in their own state or in another state – 51.0% for fully online courses (40.7% own state and 10.3% other state) and 16.7% (14.5% own state and 2.2% other state) for blended courses.

2. Postsecondary institutions – 46.5% for fully online courses and 27.1% for blended courses.

3. Independent vendors – 34.7% for fully online courses and 17.5% for blended courses.

4. Education service agencies – 28.9% for fully online courses and 15.1% for blended courses.

It is worth noting that, compared with fully online courses, blended programs are more likely to come from their own district and less likely to be sourced from postsecondary institutions, independent vendors, or their state's virtual school. 50

The Sloan Consortium report also notes that “the US Department of Education in a study of postsecondary institutions in 2006-2007 estimated that there were more than 500 colleges and universities or approximately 12 percent of higher education institutions providing distance learning services to K-12 school districts.” 51

Evaluating the Performance of Online Learning Programs

A 2008 review called Evaluating Online Learning: Challenges and Strategies for Success, concludes with the following list of recommendations for evaluating online learning:

1. Begin with a clear vision for the evaluation.


50K-12 Online Learning, page 20

51K-12 Online Learning, page 21
2. Determine the most appropriate methods for meeting your goals.

3. Budget to meet evaluation needs.

4. Develop a program culture that supports evaluation.

5. Communicate early and often with anyone who will be affected by the evaluation.

6. Dedicate adequate time and money to communicating with internal and external stakeholders at all phases.

This report also includes a number of more specific recommendations that should be considered if schools are considering evaluating their online programs. 52

The NASULGC-Sloan National Commission on Online Learning led a benchmarking effort to identify the factors that lead to “successful” online programs at public colleges and universities. It is extremely important to recognize the emphasis they place on strategic planning as being key to successful online learning programs:

*One of the most common themes we have heard across several different “areas of focus” is the essential role of senior administration in creating the proper environment for online programs to be strategic and successful. Time and again interviewees have stated the importance of the institutional leadership articulating the role of online learning as part of the institution’s way of doing business – a part of the fabric of the institution – not as a directive, but as an articulation of a vision or strategy. In addition, those senior administrators – Presidents and Chancellors and/or Provosts – must provide adequate resources to support the vision, and make it as easy as possible for faculty to engage in the design and delivery of online courses and programs.*

*Another factor that has emerged is the value of bringing a range of people together – administrators and faculty (especially early adopters) – to map out a strategic approach to online. These comments were made both affirmatively – “this was central to the success of our efforts” and wistfully – “we probably would have been further along if we had done that.”*

*Another element that has been referenced numerous times - _ in a variety of question areas – is the importance of having a single office or individual responsible for coordinating and “overseeing” the institution’s online activities. Again, not in issuing edicts or otherwise dictating to faculty what they should put online and how, but as a consistent place where faculty and administrators can go for guidance and assistance on matters of policy and procedure. The design support or student support may be provided in other places on campus, but at least everyone knows that there is one place*

Guidelines for Implementing Successful Online Learning Programs

The U.S. Department of Education's report on *Connecting Students to Advanced Courses Online* highlights the following guidelines for establishing online learning programs.\(^5^4\)

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### Table 2. Suggested Practices for the School- or District-Provider Partnership

<table>
<thead>
<tr>
<th>Suggested Practice</th>
<th>Role of Schools and Districts</th>
<th>Role of Online Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish Overall Responsibility for the Effort</td>
<td>• Identify a site coordinator who will take charge of the district’s or school’s online program, serving as key link between site and provider and primary contact for students and their parents</td>
<td>• Provide partners with a list of job responsibilities for the site coordinator</td>
</tr>
<tr>
<td></td>
<td>• Ensure quality of advanced courses</td>
<td>• Offer training or other support for site coordinator</td>
</tr>
<tr>
<td></td>
<td>• Seek and support high-quality instruction</td>
<td>• Evaluate site coordinator support and draw on coordinators’ knowledge to improve the program</td>
</tr>
<tr>
<td></td>
<td>• Recruit, counsel, and support students</td>
<td>• Create an engaging array of high-quality, standards-based courses, using well-documented design and review processes</td>
</tr>
<tr>
<td></td>
<td>• Evaluate and plan how to reach more students</td>
<td>• Increase accessibility and interactivity by creating low-tech, high-touch courses—low-tech meaning they are available via a Web site and high-touch meaning they involve frequent student-teacher interactions</td>
</tr>
</tbody>
</table>

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\(^{54}\) Connecting Students to Advanced Courses Online, page 17
The 2006 report on *Costs and Funding of Virtual Schools* includes a very detailed summary of resource needs by grade level. Some of the specific differentiators by grade level include:

**K-5:** The particular importance of parent support and training as “learning coaches,” the need for early identification/diagnostic evaluations and for varied or multiple curricular materials to accommodate different learning needs.

**6-8:** A higher degree of variability in the level of curriculum, the need for remediation, the role of interaction among students online and addressing home alone issues.

**9-12:** The importance of crossover to postsecondary education, the need to structure resources to accommodate a 24/7 schedule, college counseling, adjudication and mentoring programs.

In late 2006, the Educational Technology Cooperative of the Southern Regional Education Board (SREB) issued *Standards for Quality Online Courses*. Developed collaboratively by a team that included representatives from both K–12 and postsecondary education, national and regional organizations, and state departments of education in SREB’s 16 member states, the standards cover five broad areas – course content, instructional design, student assessment, technology, and course evaluation and management. Within each of these areas, there are also indicators for key subtopics.

1. **Standard for course content:** The course provides online learners with engaging learning experiences that promote their mastery of content and are aligned with state content standards or nationally accepted content. Indicators address academic content standards and assessments; course overview and introduction; legal and acceptable use policies; and teacher resources.

2. **Standard for instructional design:** The course uses learning activities that engage students in active learning; provides students with multiple learning paths to master the content based on student needs; reflects multicultural education and is accurate, current, and free of bias; and provides ample opportunities for interaction and communication student to student, student to instructor, and instructor to student. Indicators address instructional and audience analysis; course, unit, and lesson design; communication and interaction; and resources and materials.

3. **Standard for student assessment:** The course uses multiple strategies and activities to assess student readiness for and progress in course content and provides students with feedback on their progress. Indicators address evaluation strategies; frequency and quality of feedback to students; and assessment resources and materials.

55 *Costs and Funding of Virtual Schools*, page 7
4. **Standard for technology:** The course takes full advantage of a variety of technology tools, has a user-friendly interface, and meets accessibility standards for interoperability and access for learners with special needs. Indicators address course architecture; user interface; technology requirements and interoperability; accessibility; and technical support.

5. **Standard for course evaluation and management:** The course is evaluated regularly for effectiveness, using a variety of assessment strategies, and the findings are used as a basis for improvement. The course is kept up-to-date, both in content and in the application of new research on course design and technologies. Indicators address assessing course-effectiveness; course updates; accreditation; and data security. 

Similar, the iNACOL standards for quality online teaching are as follows:

*The teacher meets the professional teaching standards established by a state-licensing agency or the teacher has academic credentials in the field in which he or she is teaching.*

*The teacher has the prerequisite technology skills to teach online.*

*The teacher plans, designs and incorporates strategies to encourage active learning, interaction, participation and collaboration in the online environment.*

*The teacher provides online leadership in a manner that promotes student success through regular feedback, prompt response and clear expectations.*

*The teacher models, guides and encourages legal, ethical, safe and healthy behavior related to technology use.*

*The teacher has experienced online learning from the perspective of a student.*

*The teacher understands and is responsive to students with special needs in the online classroom.*

*The teacher demonstrates competencies in creating and implementing assessments in online learning environments in ways that assure validity and reliability of instruments and procedures.*

*The teacher develops and delivers assessments, projects, and assignments that meet standards-based learning goals and assesses learning progress by measuring student achievement of learning goals.*

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The teacher demonstrates competencies in using data and findings from assessments and other data sources to modify instructional methods and content and to guide student learning.

The teacher demonstrates frequent and effective strategies that enable both teacher and students to complete self- and pre-assessments.

The teacher collaborates with colleagues.  

Meeting the needs of students with disabilities is also being addressed at the state level. A survey of State Education Agencies (SEAs) in 2008 highlighted the factors associated with serving students with disabilities and providing individualized educational programs (IEPs).

The primary considerations are as follows:

1. Having some type of policy guideline and/or resources relating to virtual public school programs and students with disabilities.

2. Handling identification and evaluation of students suspected of having a disability.

3. Accommodating the various disability categories, including specific learning disabilities, emotional disturbance, autism, speech and language impairment and other health impairment.

4. Incorporating special education coordinators and/or specific therapists as part of the virtual public school staff.

5. Providing assistive technology (AT) devices.

This report also summarized the benefits and challenges of serving students with disabilities in an online learning environment:

**Benefits of Serving Students with Disabilities**

Eleven states described one or more benefits associated with serving students with disabilities in virtual K-12 public school programs. These include:

- Accessibility of curriculum for students on long-term suspension or homebound placement;
- Individualized attention;
- Self-pacing of online education;
- Availability of multi-media content and supplemental resources;

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• Students’ needs for fewer behavioral supports since they are removed from
the school building setting—especially students with attention deficit
hyperactivity disorder (ADHD), autism, or emotional disturbance (ED); and
• Creation of another placement option for students with disabilities and
their families.

Challenges of Serving Students with Disabilities
Eleven states described one or more challenges relating to serving students with disabilities in
virtual K-12 public school programs. These include:
• Opening of virtual schools before they have adequately prepared to serve
students with disabilities;
• Lack of established standards for implementing special education services;
• Revising curriculum for accessibility;
• Enrolling of students for whom virtual education is not the most suitable
education model;
• Meeting the needs of increasing numbers of students with more severe needs;
• Lack of communication between creators of IEPs and virtual school staff;
• Ensuring students have proper support from LEAs and home schools;
• Accessing sufficient numbers of related service personnel; and
• Lack of adequate funding to provide resources for closed captioning, AT
devices, multiple media components to meet various students’ needs and other
necessary adaptations.

59 Serving Students with Disabilities in State-level Virtual K-12 Public School Programs, page 8