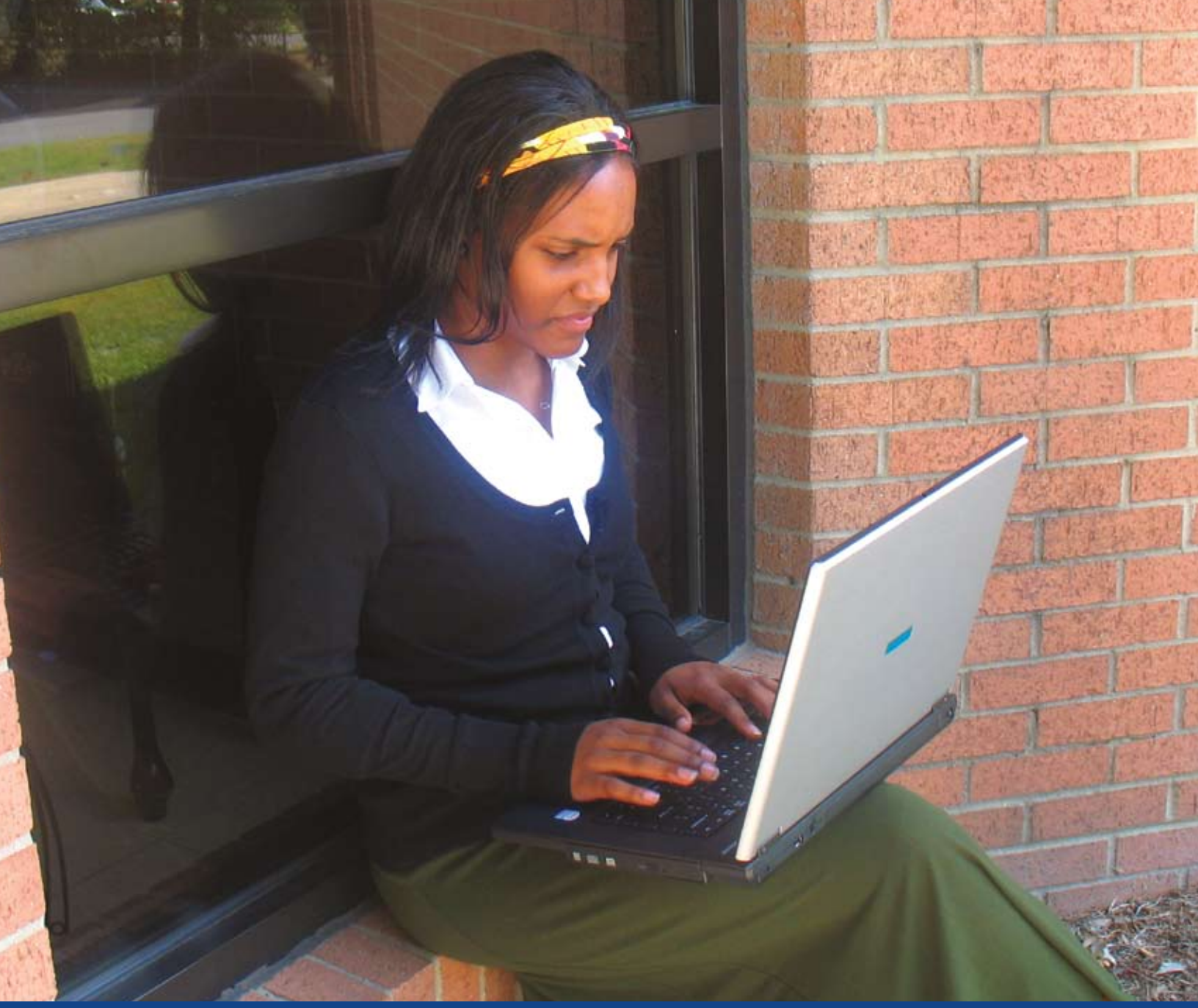

NoChild LeftBehind

U.S. DEPARTMENT OF EDUCATION

Connecting Students to Advanced Courses Online

INNOVATIONS IN EDUCATION

Connecting Students to Advanced Courses Online

INNOVATIONS IN EDUCATION

Prepared by WestEd

For

U.S. Department of Education
Office of Innovation and Improvement

2007

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U.S. Department of Education
Margaret Spellings
Secretary

Office of Innovation and Improvement
Morgan Brown
Assistant Deputy Secretary

Technology in Education Programs
Cheryl Garnette
Director

December 2007

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Contents

Illustrations

FIGURES

TABLES

Foreword

America has long been regarded as a center of innovation and creativity. In the last 50 years, American ingenuity has pioneered space exploration, developed life-saving medicines, and launched the World Wide Web. Harnessing this power of innovation for the benefit of American schools is fast becoming an education imperative.

Our country's productivity and prosperity depend on our education system's ability to meet the challenges of the 21st century. This guide highlights six providers of academic course work that are going beyond the convention of brick-and-mortar schools by delivering rigorous curricula to students through Internet technology. These providers, along with the schools and districts they serve, recognize that American students must master advanced technical skills and solve complex problems to prepare for demanding higher education and workforce environments.

Education is not a "one-size-fits-all" endeavor, and advances in technology provide an opportunity to personalize education, use time more efficiently, and tailor instruction in innovative ways. Online course work enables students to attend class inside or outside of school, learn concepts at their own pace, and receive extra help or more challenging assignments.

We know that rigorous course work is one of the best ways to improve student achievement. Yet too few high schools—especially those serving low-income and minority populations—offer challenging courses. The providers profiled in the following pages demonstrate how implementing online classes can enrich curricula and enable a greater number of students to challenge themselves.

This guide is one in a series of *Innovations in Education* publications produced by the U.S. Department of Education that highlights promising practices like strategies to engage parents in their child's education. We know that if we want our students to become the world's innovators, we must be innovators ourselves. I hope that the information in this guide will be useful to schools in their efforts to challenge students and help them realize the opportunities of the 21st century.

Margaret Spellings, Secretary
U.S. Department of Education

Acknowledgments

This guide was developed under the auspices of the U.S. Department of Education's Office of Innovation and Improvement. Sharon Horn was project director.

An external advisory group provided feedback to refine the scope of the study underlying this guide, define the selection criteria for case study sites, and clarify the text. Members (and their affiliations at the time of the advisory meeting) included Cathy Cheely, e-learning coordinator, Virginia Virtual Advanced Placement School; John Flores, chief executive officer, United States Distance Learning Association; Patrick Gould, associate researcher, Center on Education and Work, University of Wisconsin-Madison; Don Lake, director, Center for Distance and Online Learning, Los Angeles County Office of Education; Linda Morrell, director of instructional technology, Cobb County (Georgia) School District; Joyce Pittman, associate professor, instructional technology, University of Cincinnati Teachers College; and Kurt Steinhaus, board president of the International Society for Technology in Education and deputy secretary of education, New Mexico Public Education Department.

Staff in the Department of Education who provided input and reviewed drafts included Carol Cichowski, Tom Corwin, Kate Devine, Cynthia Dorfman, Ayesha Edwards, Steve Freid, Braden Goetz, Cathy Grimes-Miller, Laura Johns, Brian Lekander, Tim Magner, Meredith Miller, Iris Oliver, Wendy Tada, and Linda Wilson.

The six online course providers and their partnering districts and schools that participated in the development of this guide and the case studies on which it is based were generous with both their time and attention. We would like to thank those who were instrumental in coordinating and participating in the site visits that informed this work, including district and school staff, parents, and students who agreed to be interviewed for this project.

Colorado Online Learning
13300 West 2nd Place
Lakewood, Colo. 80228
http://www.col.k12.co.us
Chris A. Rapp, Executive Director
Tim Synder, Executive Director Emeritus

Florida Virtual School
445 West Amelia Street, Suite 301
Orlando, Fla. 32801
http://www.flvs.net
Julie Young, President and CEO
Lori Gully, Director of Florida Services

Iowa Online Advanced Placement Academy
210 Lindquist Ctr.
The University of Iowa
Iowa City, Iowa 52242
http://www.iowaapacademy.org
Clar Baldus, Project Administrator

Johns Hopkins University—Center for Talented Youth
5801 Smith Ave., Suite 400
McAuley Hall
Baltimore, Md. 21209
http://cty.jhu.edu/index.html
Patricia Wallace, Senior Director

Michigan Virtual High School
3101 Technology Blvd., Suite G
Lansing, Mich. 48910
http://mivhs.org
Robert Currie, Executive Director

Virtual High School
3 Clock Tower Place, Suite 200
Maynard, Mass. 01754
http://www.govhs.org
Liz Pape, Chief Executive Officer

Introduction

Gary Pascal, superintendent of a small, one-high-school district in the Midwest, wanted to provide a broader array of rigorous courses for his secondary students in order to better prepare them for higher education and high-paying jobs. Unfortunately, his district did not have adequate resources to offer all the advanced courses that his students might need or want. In the past, he occasionally sent a teacher to the College Board Advanced Placement Program (AP) training for preparation to teach a given AP course; but after doing so, he sometimes found that there were not enough students to justify the class, in part because of students' scheduling conflicts, both with the other courses and with extracurricular activities. He needed some other options.*

When discussing this issue with some colleagues, Mr. Pascal learned that a neighboring district had established a relationship with a distance-learning program that could supplement a school's standard curriculum with online advanced courses, delivered over the Internet. Working together, the district and program were offering local students a wide variety of online courses that they either needed (e.g., calculus) or simply wanted (e.g., macroeconomics). Intrigued by this possibility, Mr. Pascal asked his high school guidance counselor to send letters to all sophomore and junior students describing the offerings and inquiring whether they were interested. Of the 76 students who received letters, 34 said yes, and thus began Mr. Pascal's efforts to build a partnership between his school and an online course provider. Supplemental online courses have since become an integral—and vital—part of this school's curriculum, leaving Gary Pascal feeling satisfied that he has found a practical way to expand his students' academic horizons and further ready them for the increasingly competitive world of work.

As Gary Pascal learned, when given the chance to take advanced courses online, many students jump at the opportunity. But will they succeed in these courses? Ensuring success requires more than simply signing students up for a class, sitting them down at a computer, and wishing them well. At its best, the effort involves a close partnership between a district or school and the organization that offers the courses, each contributing in specific and essential ways. Drawing from case studies of six course providers and the districts and schools with which they work, this guide describes what is involved in using the Web to deliver advanced course work and what each partner must bring to the table if greater numbers of students are to have access to, and experience success in, advanced online courses.

While online course providers, themselves, may find the guide useful, it is intended primarily for district and school decision-makers (e.g., curriculum directors, AP coordinators) who are looking

* A pseudonym

for ways to give their students greater access to advanced course work and see online courses as an enticing option. Its aim is to familiarize them with the issues they must consider and address if students are to achieve success in this new form of learning.

New Workforce Demands Call for New Approaches to Worker Preparation

The need for a better and *differently* prepared U.S. workforce is indisputable. Today's global economy has created a high demand for intellectually strong workers, capable of solving complex problems and developing innovative services and products. From the 1983 call by the National Commission on Excellence in Education to increase graduation requirements[1] to the ambitious new vision of the New Commission on the Skills of the American Workforce,[2] numerous reports have documented the significant changes in the world economy wrought by globalization and automation and the growing demand on Americans to master advanced skills, from mathematics to problem solving, and to work more creatively.

Some have started referring to the early 21st century as the conceptual era in which prosperity and well-being are defined less by traditional measures, such as the ability to perform well in low-skill manufacturing roles, and more by the intellectual capacity and ingenuity required to compete in a rapidly expanding global marketplace.[3] Former Federal Reserve Board Chairman Alan Greenspan touched on changing work demands when he observed in a 2005 speech, "Work is becoming less physically strenuous and more demanding intellectually, continuing a century-long trend toward a more conceptual and a less physical economic output."[4] The National Association of Manufacturers made the point more directly in its annual Labor Day report for 2005, *The Looming Workforce Crisis: Preparing American Workers for 21st Century Competition*, which refers to a "widening skills gap" in the context of a U.S. Department of Labor projection that 85 percent of future jobs will require, minimally, a two- or four-year college degree.[5]

In its compelling 2006 report, *Tough Choices or Tough Times,* the New Commission on the Skills of the American Workforce documents a competitive and decentralized global economy in which even highly skilled workers are in danger of losing their jobs to overseas competitors who can work from afar for a much lower wage, as when an Indian engineer accustomed to earning $7,500 a year vies for work against an American engineer earning $45,000 a year.

This is a world, the commission argues, "in which comfort with ideas and abstractions is the passport to a good job, in which creativity and innovation are the key to the good life, in which high levels of education—a very different kind of education than most of us have had—are going to be the only security there is."[6]

Also of growing importance in this changing world is fluency in a foreign language. The National Security Language Initiative, launched in January 2006, was conceived to strengthen U.S. competitiveness and national security by increasing the number of Americans learning foreign languages, especially those deemed to be of strategic importance. Among the languages considered by the U.S. Department of State to be most critical are Arabic, Russian, Hindi, Farsi, Korean, and Chinese,[7] none of which have been

widely available in U.S. K–12 schools. In its 2006 report, *Answering the Challenge of a Changing World: Strengthening Education for the 21st Century,* the U.S. Department of Education captures the concern that other developed countries whose students learn multiple languages will gain an edge over a primarily monolingual U.S. It notes, for example, that while more than 200 million Chinese students study English, in comparison, only about 24,000 American elementary and secondary school students study Chinese.[8]

The Role—and Dearth—of Advanced Course Work at the Secondary Level

In the face of these rapidly intensifying demands on the global worker, the United States continues to experience disappointingly low rates of high school completion and college preparation.[9] Roughly 30 percent of U.S. students fail to graduate from high school within four years, if at all,[10] with the number approaching 50 percent for African-American, Hispanic, and Native American students.[11] Among those who do receive a high school diploma, some find that while they have fulfilled all their district's graduation requirements, they have not met the entrance requirements for their state university system.

Still others are accepted into higher education but require remedial classes before they can undertake college-level studies. In its report released in September 2006, the Secretary of Education's Commission on the Future of Higher Education noted that "among high school graduates who do make it on to postsecondary education, a troubling number waste time—and taxpayer dollars—mastering English and math skills that they should have learned in high school. And some never complete their degrees at all. … "There are also disturbing signs that many students who do earn degrees have not actually mastered the reading, writing, and thinking skills we expect of college graduates. Over the past decade, literacy among college graduates has actually declined. … The consequences of these problems are most severe for students from low-income families and for racial and ethnic minorities."[12]

There are no simple solutions to this complex challenge. Indeed, students' education success—including their likelihood of graduating from high school eager and prepared to succeed in college—depends on a wide range of factors, not all of them even related to their schooling. But all other things being equal, it is axiomatic that if students are to be successfully prepared for the demands of higher education and the increasingly competitive work environment, they must have access to the right course work. As students move through secondary school, they must be provided with greater rigor in their core classes, that is, the basic courses needed for graduation. But students also must have access to courses beyond the basic core, courses that push them even harder intellectually, deepening their knowledge and understanding in key content areas and helping them to hone high-level research and thinking skills. In short, students need access to advanced course work.

What constitutes advanced course work? For its annual report, *The Condition of Education*, the U.S. Department of Education's National Center for Education Statistics (NCES)—the primary federal entity that collects and analyzes education-related data—defines advanced courses according to the "academic pipeline" taxonomy.[13] Based on this classification system, NCES identifies advanced mathematics courses as those with

content that is more challenging than algebra I and geometry I and advanced science courses as those with content that is more challenging than general biology. Advanced English courses are those designated as honors, and advanced language courses are those designed for students who have already completed two full years of high school courses in a given language. NCES also considers as advanced any courses authorized by the College Board or the International Baccalaureate (IB) foundation.[14] (For more information about AP and IB programs, see page 10.)

In fact, the percentages of students taking advanced courses have risen over the years. According to NCES, 68 percent of students graduating from high school in 2004 (the last year for which these data are available) had completed advanced course work in science, compared to just 38 percent in 1982. Similar growth occurred in the percentage of graduates who had completed courses in advanced academic mathematics—50 percent in 2004 compared to 26 percent in 1982.[15] In English, the percentage of students who had taken an advanced course classified as "honors" rose from 13 percent to 33 percent during this period.[16] One challenge, of course, is to raise these percentages across the board. But equally important is to get more students into the kinds of even higher-level advanced courses that will open more doors for them in their subsequent academic pursuits. NCES found that only 18 percent of graduates in 2004 had completed at least one course of either chemistry II, physics II, or advanced biology, and a similarly small percentage (14 percent) had completed a calculus course.[17]

Unfortunately, access to advanced classes is neither equal, nor even universal, across the nation's schools. NCES's most recent transcript analysis, which looked at the availability of advanced courses in English, math, science, and foreign languages, found that for more than a quarter of U.S. high school students, there were no advanced courses available at their home school. While 74 percent had access to at least one course, only 58 percent had access to at least two courses, and only 22 percent attended schools that offered four or more advanced courses. NCES data show that students in rural schools and in schools with a 12th-grade enrollment smaller than 150 have the least opportunity to take one or more advanced courses in math, science, English, or a foreign language.[18]

Even in schools that offer advanced courses, access can be limited and unequal. One problem is that in many schools advanced courses are "singletons." These are courses that, due to limited enrollment or staffing, have only one section and, therefore, are offered at only one time of day (unlike required courses, such as algebra I, for which multiple sections are likely to be scheduled throughout the school day). Among the students most likely to experience scheduling conflicts are those who want to take multiple advanced courses (e.g., AP Spanish literature and AP chemistry) but find that the courses are scheduled at the same time, or who want to take one or more singleton advanced courses and one or more singleton electives (e.g., studio art III, orchestra, and chorus). The smaller the school, the more likely it is that there will be scheduling conflicts for students interested in advanced courses. In some instances, however, students seeking advanced courses have no scheduling conflicts but are closed out of advanced courses because the courses themselves are oversubscribed and

the school does not have the resources to add more sections.

While some schools open such courses to any student who shows a strong interest, other schools require students to meet certain prerequisites before signing up for higher-level course work. For example, students may need to be recommended by one or more teachers, be designated as an honors student, have a certain grade point average, or have a history of success in college preparatory classes. While it is difficult to argue against the reasonableness of wanting students to demonstrate that they have the knowledge and skills needed to succeed in advanced courses, if such access filters are applied too strictly—taken as rigid rules rather than guidelines—they can exclude students who, with the right support, could succeed despite having only an average (or slightly less-than-average) academic record. In this category might be, for example, the student whose learning disabilities cause him to struggle in English language arts but who does well in mathematics, or the late-blooming learner who, interest piqued by a particular subject, is willing to work harder than ever before in order to succeed. Unfortunately, despite a growing recognition that advanced course work is beneficial to a wide range of students, so long as there is a paucity of such courses in U.S. secondary schools and, therefore, a limited number of seats available, only those students considered most qualified are likely to be accepted for the limited number of seats in advanced courses.

As districts and schools seek to increase the numbers of students taking advanced course work, more of them have begun turning to online course delivery as a practical and effective means of expanding access. Based on its survey of the chief administrators from 366 (out of 16,000) school districts nationwide, representing 3,632 schools and 2 million students, the Sloan Consortium estimates that, during the 2005–06 school year, 700,000 K–12 students participated in online learning. More than half of the respondents (57.9 percent) reported having at least one student who had taken an online course in 2005–06, and an additional quarter (24.5 percent) reported expecting at least one student to take an online course within the next three years. The Sloan survey asked about both online courses (defined as those for which all or most of the content is delivered online, with at least 80 percent of seat time replaced by online activity) and blended or hybrid courses (defined as those that use both online and face-to-face delivery with a substantial portion—30–79 percent—of the content delivered online). Although these percentages relate specifically to online courses, the fact that teachers at bricks-and-mortar schools are incorporating online components into their traditional courses is a significant development, an indication that educators are increasingly seeing online learning as a logical extension of teaching and learning in a traditional classroom. While not all of the districts captured in the Sloan survey are necessarily using or planning to use online courses to deliver advanced content, approximately 68 percent of Sloan respondents rated as "important" using online learning to offer AP or college-level courses, and a little more than half (approximately 55 percent) rated as "important" reducing scheduling conflicts for students.[19]

Online learning is fast becoming a part of the norm. The Southern Regional Education Board (SREB), a nonprofit, nonpartisan organization that works with leaders and policymakers in 16

member states to improve pre-K through postsecondary education, reports that 12 of its member states already operate a state-sponsored virtual school, and each of its other states is expected to have one within the next couple of years. Once implemented, such schools are likely to ramp up quickly in the face of strong interest. For example, the Georgia Virtual School, created by legislative action just two years ago, already had 4,600 students enrolled in courses as of the 2006–07 school year. Of the 80 courses it offers, 18 are AP.[20]

As growing numbers of districts and schools become interested in using online learning to deliver advanced course work, how do they go about translating their interest into on-the-ground success? This guide helps answer that question.

The Online Course Providers Featured In This Guide

The course providers featured in this guide, collectively accommodating districts and schools large and small with a variety of courses and delivery models, are Colorado Online Learning, Lakewood, Colo.; Florida Virtual School, Orlando, Fla.; Iowa Online Advanced Placement Academy, Iowa City, Iowa; Johns Hopkins University—Center for Talented Youth, Baltimore; Michigan Virtual High School, Lansing, Mich.; and Virtual High School, Maynard, Mass. Despite several names that include the term "virtual school," all of these providers are supplemental only, that is, they are not diploma- or credit-granting institutions; rather, they work in concert with bricks-and-mortar schools, which grant course credit based on the grades provided by the online instructor and, ultimately, grant the high school diploma. Table 1 on page 7 includes selected variables for each provider. Additional descriptive information about each provider is included in the provider profiles in Part III of this guide.

These highlighted providers were selected from a larger pool of 35 through benchmarking and case study methodologies adapted for the study behind this guide and described in Appendix B on page 79. An external advisory group helped guide the development of a research-based conceptual framework (mentioned in that appendix) for analyzing the providers and also informed site-selection criteria. Providers were sought that met five basic criteria:

- Provider and participating school leaders assess students for their readiness to take online courses;
- Provider, school leaders, and parents create a "ladder" for student success in online learning (i.e., ensure adequate student support);
- Courses are designed to meet student needs and are highly engaging;
- Provider has at least two years of performance data; and
- Provider serves students especially in need of greater access, including disadvantaged students and rural students.

All providers were screened using a weighted-criteria matrix; the six providers featured in this publication best met the selection criteria and also represent a range of geographic locations and organizational types (e.g., based in universities or state departments of education, nonprofit).* When online courses are intended to

* Inclusion in this guide should not be construed as an endorsement of any particular online provider or its products or services, including any courses, software, or other materials or tools it licenses from commercial or other vendors. To the extent that such vendors are named in this guide, it is only to describe the practices of the featured provider. It is recommended that, prior to engaging in any contract for products or services, readers carefully examine the claims, backgrounds, and references of any provider, including those featured in this guide.

Table 1. Selected Variables of Highlighted Online Course Providers[a]

Online Course Provider	Year Initiated	Initiator	Locales Served	Types of Courses Offered	Number of Courses Currently Offered	Total Student Enrollments Since Inception	Approximate Per-Student Cost Per Course
Colorado Online Learning	1998	Consortium of 14 districts	Statewide	AP,[b] Honors, Dual-Credit, Core, Electives	80	6,832	$200
Florida Virtual School	1997	District partnership with state grant funding	Statewide, National, International	AP, Honors, Core, Electives	80	200,000	$440 per half-credit enrollment
Iowa Online Advanced Placement Academy	2001	Belin-Blank Center	Statewide	AP	11	5,616	$380 (does not include cost of the AP exam)
Johns Hopkins University—Center for Talented Youth	1994	John Hopkins University Center for Talented Youth	National, International	AP, Accelerated,[c] Honors	60	53,000	Varies by course; ranges from $440 to $1,740
Michigan Virtual High School	2000	Michigan Virtual University	Statewide	AP, Core, Electives	110	26,700	Varies by course; ranges from $275–$350 per semester
Virtual High School	1996	Concord Consortium, Hudson Public Schools	National, International	AP, IB,[d] Honors, Core, Electives	216	40,028	$130 per semester course with standard school membership

[a] Data reported by online providers both here and in the profiles are for 2006–07.

[b] Advanced Placement

[c] An accelerated course compresses the content that normally would be covered in a longer course into a shorter time frame.

[d] International Baccalaureate

supplement the high school curriculum, course delivery necessarily requires a partnership between the provider and the site-based customer, which, depending on the circumstances and how a provider is set up, can be an individual school or a district operating on behalf of multiple schools. For each of these six providers, several of its education partners (either districts or schools, depending on how the provider works) also were recruited for the study to add the user perspective. These districts and schools were identified by the providers as being active and successful partners that had successfully established online options for their students. They represent a range of settings around the country, from rural high schools to suburban districts to large urban centers. From these varied sites, principals, site coordinators, teachers, parents, and students were interviewed about their experiences with their distance-learning program or online courses.

To understand what was contributing to success for these providers and a selection of their partner districts or schools, a "snapshot" case study was conducted for each one. Researchers collected data during one-day site visits; conducted interviews in person or by telephone with provider administrators, online instructors, leaders from districts and schools using the providers' online courses, and parents and students; and reviewed online courses and related documentation. This guide synthesizes information from a cross-site analysis of the case studies.

The descriptive research process used to inform this guide yielded some suggested practices—ways to do things that others have found helpful or lessons they have learned. This is not the kind of experimental research that can provide valid causal claims about what works. Readers must judge the merits of any suggestions according to their understanding of the reasoning behind them and how the suggestions may address their local circumstances.

Organization of the Guide

Part I of this guide explores the benefits of using online courses to deliver advanced content for secondary school students, and it identifies the specific types of advanced course work most commonly available from online course providers.

Part II examines key implementation factors for districts or schools to consider if they decide to move ahead with establishing or expanding a program of advanced online learning for their students. This section focuses in particular on the need for districts and schools to work in partnership with an online provider. Examples are drawn from across the six online providers and their partner districts and schools. Vignettes, based on interviews with providers, district or school administrators, site coordinators, and students, are used to illustrate various aspects of what online learning looks like in practice, although pseudonyms are used to protect individuals' privacy. To further illustrate some points, sample materials taken directly from the programs or partner schools are presented in accompanying figures.

Part III provides a brief profile or narrative snapshot of each individual provider, its history, and key features. Readers may want to refer to these profiles to get a more comprehensive and general understanding of each provider.

PART I

What Online Learning Offers For Those Seeking Advanced Content

You're a high school administrator who has been debating how to better prepare your students for college, and you've been wondering about the possibility of adding some new, higher-level courses. To inform your decision, you and your staff have conducted a thorough appraisal of the current curriculum, including students' access to existing courses and their interest in courses not currently available. You've looked, for example, to see if students have access to all the courses required for admission to the state university system. You've looked at schedules and sequencing to see whether students have multiple opportunities to take advanced courses beyond the baseline university requirements. You've asked your high school counselors and teachers whether they know students who could be performing at higher levels if they were challenged with more rigorous content. You've surveyed students and their parents to find out what additional courses students need or want. You've done all this and more, and what you've learned will help guide your next steps.

For example, if there appears to be great demand for physics or for advanced science courses in general, you may decide to commit your available funding to hiring another highly qualified teacher in that area or sending one or two of your current teachers to receive training to teach advanced courses. If neither of those options is realistic, you may instead seek to establish an arrangement with a local institution of higher education (IHE) to offer the course(s) in some sort of a partnership with your school. Or you may look for another relatively nearby school that is offering the courses you lack, to see if you can arrange for some of your students to take those classes, either by you busing them to the school or by connecting them through videoconferencing, a different form of distance learning.

But what if you cannot locate a school already offering the course or do not have an IHE in your area? What if, in addition to having 20 students who all want to study advanced physics, there are another 10 who want to study 10 *different* advanced courses?

What if your review suggests that you're already providing a sufficient array of advanced courses

but don't have enough sections to accommodate all interested students and, thus, some students are closed out each semester? What if you find that scheduling conflicts are keeping many students from taking desired courses? What if students who have asked for advanced courses also express interest in learning more about the kinds of information technology they are likely to encounter in the world of work?

That's a lot to think about. But for each such question, online learning can offer an answer.

With online learning, districts and schools are not limited to providing only those advanced courses popular enough to ensure full course enrollments (perhaps AP physics or Spanish IV, for example) and, therefore, to warrant committing or training a teacher. With online learning, the individual high school student who wants to study genetics or Arabic can do so. And if a school's AP history teacher can only accommodate 35 of the 45 students who want to take the class, online learning means that the other 10 students do not have to wait another semester or another year to take the course. They can study online.

With online learning, districts and schools can offer important scheduling flexibility to the many students who might need it, whether it's the girl who is trying to fit in extra credits in order to graduate early or the boy who would like to take an additional course but cannot fit it in during the regular school day and needs to leave immediately after his last class to take care of his younger brothers while his parents are at work. Traditional classroom-based courses and those offered through videoconferencing rely on synchronous interaction between students and teacher, requiring all students to show up at a time that is convenient to the school or teacher. In contrast, most online learning programs offer some degree of asynchronous interaction in their courses, which allows students to "attend class" at their convenience, either during or outside the regular school day.

For any student who seeks advanced course work, studying online does more than just offer the sought-after content. It also offers an opportunity to use and become comfortable with the kinds of information technology that are fast becoming an integral element of so many living-wage jobs. For students from low socioeconomic backgrounds who are less likely to have access to adequate technology—or help with using it—in their homes, the opportunity to study online using school equipment is especially important.

Thus, while online learning is certainly not the only way to supplement the curriculum with advanced courses, it offers a practical and flexible way to enrich a district's or school's academic program and to offer advanced courses to greater numbers of students, with the added benefit of helping students develop key technology-related skills.

Advanced Course Offerings

Advanced online courses are available in a number of different options, chiefly, dual-enrollment, honors, and courses developed under the Advanced Placement (AP) or the International Baccalaureate (IB) programs.

Dual-enrollment courses, also known as *dual-credit courses,* give students the opportunity to

earn college credit while still in high school. In developing these courses, providers work with a local college or university to ensure that the courses meet that institution's requirements for students to receive college credit. In some cases, students may choose to take these courses for high school credit only, but those seeking college credit are given additional work (e.g., more writing-intensive assignments) and their performance is evaluated against higher standards (e.g., dual-credit students may be expected to use a greater number of resources or references in a research project). For example, Colorado Online Learning (COL), based in Lakewood, Colo., offers a dual-enrollment option for several of its existing courses. Based on conversations with faculty from Colorado colleges and universities, the program developed an additional set of assignments (and guidelines for the instructor) for those students who want to earn college credit. The course rigor and grading rubric are preapproved by the credit-granting university or college. Should a dual-enrollment student later apply for admission to a different IHE than the one that granted the credits, the second IHE can accept the credits at its discretion.

Honors courses are similar to dual-enrollment courses in that they require students to complete assignments of greater difficulty and often at a faster pace than in regular high school courses. Similarly, they require instructors to evaluate students' work against higher standards. Unlike dual-credit courses, however, completion of an honors course does not result in college credit. Instead, students typically receive additional grade points for passing honors courses, and honors courses are considered to strengthen a student's transcript for college application purposes.

AP courses are intended to give students rigorous content and the opportunity to earn college credit while still in high school. Online AP courses are designed by online instructors who adhere to course standards set by the College Board, the not-for-profit membership association that, in addition to operating the AP program, is best known for developing such standardized tests as the SAT. The College Board regularly audits and evaluates AP courses and develops a corresponding exam for each one. Administered every May at designated schools or approved exam sites, the AP exams consist of multiple-choice and free-response (e.g., essays, problem-solving exercises) items. In the month following the exams, more than 4,000 college and AP teachers come together at centralized readings to score the free-response sections. Free-response scores are then combined with multiple-choice scores to form a composite score that ranges between 1 and 5. Most colleges grant credit and advanced placement to students earning a score of 3 or higher. As part of the AP course work they offer, some of the programs highlighted in this guide provide access to the self-paced AP exam reviews from the College Board, which cover course content in test-question format. (An analysis of the Third International Mathematics and Science Study [TIMSS] assessment results suggests that participation in AP mathematics and science courses has enabled U.S. students to exceed the proficiency levels of students from other countries on advanced mathematics and physics tests.[21])

IB courses are offered as part of the International Baccalaureate Diploma Programme, a rigorous two-year curriculum (geared primarily to students aged 16 to 19) that leads to a

qualification (i.e., degree) that is widely recognized internationally. The Diploma Programme—operated by the IB, a nonprofit education foundation—prepares students for a university education, with a specific focus on helping them develop the ability to communicate with and understand people from other countries and cultures. While the IB program itself is well established internationally, it is not yet as well known or as widely used in the U.S. as the AP program. But when several American-based international schools that are members of the Maynard, Mass.-based Virtual High School (VHS) expressed an interest in an online IB economics course, VHS picked up on it. In 2004, VHS became the first online course provider to pilot an online IB course, in economics. During the two-year pilot phase (i.e., 2004–06), the course was offered entirely online to 11 students at schools in the U.S., Brazil, and Ecuador. The primary goal was to find out whether students could successfully complete an IB course online. Because IB courses are designed to be extremely hands-on and interactive, with emphasis on inquiry, communication, and collaboration, the challenge of delivering them online is to create this same type of experience in a virtual classroom. As it turned out, all 11 students passed the IB economics examination. Promising findings from evaluation surveys of participating students and school leaders resulted in expansion of the pilot, which, for the 2007–08 and 2008–09 school years, will include additional offerings. IB also is considering expanding its online presence by partnering with additional providers, such as Florida Virtual School (FLVS).

Foreign language courses are offered by each of the six online providers highlighted in this guide. In addition to offering such standards as Spanish, French, German, and Latin, a number also offer Mandarin Chinese. VHS developed its Mandarin Chinese course through its partnership with Shekou International School in China and uses native Mandarin-speaking teachers to develop and deliver the course. COL's executive director recently traveled to Beijing, China, to secure a partner in course development, and Michigan Virtual High School (MVS), based in Lansing, Mich., has partnered with Michigan State University and, through it, with the U.S.-China Center for Research on Educational Excellence, to offer Chinese courses that range from beginning to advanced levels. MVS also has developed an Arabic language course.

While it is typical for online language courses to focus on developing students' reading and writing skills, course designers at Johns Hopkins University–Center for Talented Youth (CTY), in Baltimore, are concentrating, in addition, on teaching "productive speech," that is, developing conversational skills. To better develop students' speaking skills, instructors are incorporating more opportunities for students to communicate among themselves and with the instructor both synchronously (i.e., all parties communicating at the same time) via two-way streaming video and asynchronously (i.e., parties communicating at different times) through audio recordings.

A survey of the use of distance education courses offered in public schools during the 2002–03 school year, conducted for the U.S. Department of Education's Office of Educational Technology and released in March, 2005, showed that some 50 percent (approximately 2,700) of responding districts that offered distance learning had students enrolled in AP or college-

level courses. About one-quarter (23 percent) of all K–12 enrollments in distance education courses (for students regularly enrolled in districts) were taking courses in social studies or social sciences; 19 percent were in English/language arts; 15 percent were in mathematics; 12 percent were in natural or physical sciences; 12 percent were in foreign languages; and 12 percent were in some other unspecified curriculum areas.[22] (See Growing Student Interest in Online Learning, p. 14.)

Such are the variety of online course choices that district or school officials who peruse the catalog from an online provider may be tempted to commit immediately. But thoughtful planning and careful implementation are essential if a district or school is to realize the full potential of online learning to help advance a broad array of students toward high school graduation and success in higher education. Part II of this guide explores key concepts to consider when thinking about introducing advanced courses online.

Growing Student Interest in Online Learning

As is happening nationwide, a number of districts and schools partnering with featured course providers, and therefore studied for this guide, have seen steady growth in students' desire to study advanced courses online. Schoolcraft High School, in suburban Michigan, is a small school, reaching its all-time peak enrollment of 430 students in 2006–07. Prior to offering advanced online courses through the Lansing-based Michigan Virtual High School (MVS), it had bused an average of only one student every five years to another school to take Advanced Placement (AP) courses, which Schoolcraft could not offer itself due to the lack of resources (i.e., qualified faculty) and enough students to fill one section of an advanced course. Since partnering with MVS in 2002, Schoolcraft has had an average of 3.5 students per year enrolling in online AP courses. Eighteen Schoolcraft students have successfully completed AP courses through MVS and passed the related AP exam.

Fowler High School, a small, rural Colorado school, also began offering online courses five years ago, in 2002, working with Colorado Online Learning (COL), a statewide online course provider. That first year, Fowler had only one student studying online, and that student was taking a core course. But the following year, all 12 of Fowler's budgeted online enrollments were filled, and one of those 12 students was taking a dual-enrollment course (i.e., an advanced course that meets both high school and local Colorado college and university requirements and standards). Last year, four Fowler students took and successfully completed online dual-enrollment courses, and Fowler is budgeting for additional enrollments, with the expectation that interest will continue to grow. (The NCES publication, *Dual Credit and Exam-Based Courses in U.S. Public High Schools: 2002–03,* reports that 25 percent of the high schools that offer dual-credit courses do so online.[23])

Small schools like Fowler and Schoolcraft, with limited faculty resources and, at least initially, relatively little student interest in advanced courses, may stand to gain the most from the online option. But districts and schools everywhere are turning to online learning for their students. Virtual High School (VHS), based in Maynard, Mass., and working with schools and districts nationwide and, even, internationally, has seen a dramatic increase in enrollment across the board in recent years. The number of schools using VHS courses has increased by 118 percent in the past five years and the number of students by 154 percent. And students are choosing more advanced courses. Between 2002 and 2006, the number of student course enrollments in AP courses through VHS increased from 18 to 497.

Florida Virtual School (FLVS), serving Florida schools statewide, saw AP enrollment more than double between 2003 and 2006,with enrollments rising from 976 to 2,348. The upward trend included a rise in the percentage of minority students taking AP courses online, from 35 percent of all FLVS AP enrollments in 2003 to 43 percent in 2006. By the end of school year 2006–07, approximately 63 percent of the students enrolled in FLVS AP courses had taken the corresponding AP exams.

PART II

Planning and Implementing Online Courses to Advance Student Learning

The appeal of online learning may be captured most concisely in the motto of the Orlando-based Florida Virtual School (FLVS), one of the country's earliest providers of online courses: "Any time, any place, any path, any pace." At its founding a decade ago, FLVS was one of only a handful of statewide or national providers of Web-based courses in the country. As of mid-2007, there were 25 statewide providers (i.e., those based in and primarily serving a single state),[24] and the number of university-based, district-based, and private for-profit providers is growing as well. All offer some type of advanced course work.

Thus, districts and schools that recognize the potential of online classes to enhance and equalize students' education opportunities, including broadening access to advanced content, will find it easier than ever to connect with a provider that offers the courses their students need. Before doing so, however, it is helpful to have a basic understanding of what to look for in an online provider and of the kind of district- or school-provider partnership that most readily lends itself to student success with this alternative—but increasingly common—approach to delivering advanced courses.

Partnering for Student Success

Whether in a traditional classroom setting or a virtual (i.e., online) setting, student learning depends on many factors, chief among them is a student's motivation and commitment. While such characteristics are intrinsic to some students, in others, these essential learning traits can be engendered through engaging teaching or a subject of special interest to a student. And, according to some school staff interviewed for this guide, the online setting itself serves to catalyze interest and motivation in some students.

But as is true of any formal education effort, in the online setting, a student's success also depends on many factors beyond his or her control, some that are the responsibility of the student's district or home school and others that are the responsibility of the online provider. Even though each organization—school or district and provider—has distinct roles, the responsibilities are tightly

connected and some must be carried out in partnership. For example, while it is the district's or school's responsibility to investigate and understand students' needs for and interests in supplemental advanced course work, it is the provider's responsibility to offer an array of high-quality, engaging courses that meet state academic standards and are likely to address the needs of a district or school. And while it is up to the district or school to make sure students receive adequate local support for online learning (e.g., course counseling, technology assistance), the provider must provide training and other preparation for the individuals in these important support roles. Table 2 (on page 17) identifies suggested practices for school- or district-level educators and their partnering online provider in carrying out their respective responsibilities for enabling students to take full advantage of what online learning has to offer. While all of these responsibilities apply irrespective of whether the online courses are delivering advanced or core content, some aspects of implementation (e.g., student recruitment, student support) are even more important in the context of advanced course work, especially when working with students who have had less experience with advanced content or who may be less motivated, or both. For additional implementation guidance, see Appendix A, Online Learning Program Implementation Checklist for District or School, on page 77.

Establishing Overall Program Responsibility

Integrating online learning into an existing education system is a worthwhile, but complex endeavor that requires focused management of a range of detailed activities, as well as ongoing, effective communication between a district or school and its online provider. For these reasons, any district or school planning to offer online courses will profit from identifying a site coordinator, at either the district level or at each school. This is the individual who will have primary responsibility for implementing the online program, including ensuring adequate student support. The coordinator is the primary link between district or school and provider, as well as being the primary program contact for online students and their parents. This individual usually recruits, counsels, and enrolls students in online learning and, in many cases, provides support for students over the course of their online studies. In the long run, whether the site coordinator is full time or part time depends on how many students are enrolled in an online program. For example, at a smaller school with only a handful of students taking online courses, a staff member may split his or her time between serving as a site coordinator for the online program and serving as a guidance counselor. A district or school may identify a coordinator before even choosing a partner provider. In such cases, the coordinator may lead the research effort. A coordinator also may be appointed after a partner has been chosen. Either way, some providers have found it useful to develop a list of key coordinator responsibilities, which they share with districts and schools. Figure 1 on page 18, is an excerpt from the site coordinator manual for Colorado Online Learning (COL); it lists typical roles for a site coordinator working with COL. Providers write up such descriptions to help districts and schools identify the most appropriate person for the coordinator position.

Iowa Online Advanced Placement Academy (IOAPA), based at the University of Iowa in Iowa

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

Suggested Practice	Role of Schools and Districts	Role of Online Provider
Establish Overall Responsibility for the Effort	• 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	• Provide partners with a list of job responsibilities for the site coordinator • Offer training or other support for site coordinator • Evaluate site coordinator support and draw on coordinators' knowledge to improve the program
Ensure Quality of Advanced Courses	• Inquire about and compare statewide or national online course providers • Look for appropriate design and review, and alignment to standards • Consider teacher-student interaction and course pacing • Offer students a rigid, yet flexible, learning environment in which they must meet assignment and exam deadlines, but can do their work at anytime during the day and week	• Create an engaging array of high-quality, standards-based courses, using well-documented design and review processes • 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 • Evaluate course quality
Seek and Support High-quality Instruction	• Consider instructor selection and support • Consider how instructors are monitored and evaluated	• Ensure that instructors are prepared—online providers often present initial professional development for online instructors and always require that their instructors have content expertise • Ensure that instructors are monitored and evaluated
Recruit, Counsel, and Support Students	• Assign a site coordinator to assume overall site-based program responsibility • Utilize teachers, counselors, and others to recruit beyond the standard pool of high-performing students • Prior to course enrollment, use student self-assessments and other tools supplied by online provider as conversation starters for counselors to use with students to help them understand and prepare for the demands of online learning • Assign a site-based mentor or counselor to provide online learners with encouragement and, if possible, content support • Provide site-based technology support	• Offer tools and training to prepare school leaders to identify and enroll students in appropriate courses • Generate awareness within the school or district community about the availability and benefit of online learning • Actively recruit students from beyond the standard pool of high-performers • Provide training for site coordinators and mentors • Implement a simple system for regular reporting of student progress in each course, to aid students, parents, and teachers in monitoring student success • Provide technical support to help students, districts, and school sites with technical issues • Use survey responses and other data to improve student support
Evaluate and Plan How to Reach More Students	• Track student progress in online courses to guide local improvements and be ready to offer data to course provider for evaluation purposes • Seek alternative sources of funding to support online learning	• Evaluate outcomes and improve the program over time • Seek alternative sources of funding to support online learning • Plan how to accommodate growing demand

Figure 1. Colorado Online Learning Site Coordinator Responsibilities

COL Site Coordinator Responsibilities

Site Coordinator Responsibilities: Site coordinators are very important to the success a student has in an online course. Depending on the local school situation, responsibilities may include the following:

1. Providing information to students and parents about COL courses
2. Processing and approving student registrations
3. Monitoring/encouraging student progress
4. Contacting COL staff and instructors as needed
5. Communicating with parents regarding COL courses
6. Reviewing weekly eligibility reports
7. Facilitating grade transcription
8. Reviewing invoices and facilitating payment
9. Brokering issues needing resolution, such as cheating and plagiarism, inactive students, technical difficulties, and extra assistance to students

Source: Excerpted from *Colorado Online Learning Site Coordinator Handbook*

City, specifies that its partners must designate both a site coordinator and a technical coordinator. While the site coordinator manages the district's or school's overall implementation of online learning, the technical coordinator ensures that online students have the necessary technology and does initial troubleshooting of any technology-related problems. As with the site coordinator position, a technology coordinator's time commitment depends to some degree on how many students are taking online courses, and, in the case of a district-based coordinator, how many schools have students studying online.

Some online providers offer training for site coordinators. Virtual High School (VHS), based in Maynard, Mass., has a four-week course designed to familiarize site coordinators with its policies and procedures. The course is taught using the same platform (i.e., the Web-based framework on which software applications operate and, in this case, courses are delivered) as VHS uses for its student courses; the intent is to give coordinators a good understanding of how students' online courses are delivered so they are better able to answer students' delivery-related questions. According to the 2004–06 VHS evaluation conducted by Learning Point Associates, approximately 90 percent of site coordinators who participated in satisfaction surveys during both of these school years indicated that the VHS training and orientation effectively prepared them to understand the program, use the technology, and recruit and register students.[25] In Michigan, MVS maintains a staff of regional ambassadors whose responsibilities include visiting schools in their territory and offering site coordinator training based on the school's

Baseline Technology Requirements for School or District

While an online course provider must design and deliver high-quality courses, school leaders must ensure that their site has the technological capacity to support course delivery. Despite the increasing integration of such high-tech interactive media as electronic whiteboards, chat rooms, and audio and video streaming, technology requirements for districts and schools are actually fairly simple: Students need a computer with high-speed, broadband Internet access and properly adjusted settings for the firewall, which is designed to control access (e.g., to certain Web sites). Most schools provide computer access through computer labs, which are open to students throughout the day and, in some cases, after regular school hours or on weekends. Because online courses are designed to operate with one or more, but usually not all Web browsers (i.e., the software that allows a computer to read and interact with Web text, images, and tools), districts or schools also must ensure that their computers are outfitted with a browser (e.g., Explorer, Safari, Firefox) compatible with the online courses it plans to offer.

needs. For example, an ambassador may train the coordinator in how to navigate the provider's Web site, enroll students, or generate student progress reports. An ambassador also can explain whom to contact for technical support or can provide answers to questions about courses and enrollment dates.

The time commitment required for a site coordinator depends, in part, on the number of students interested in online learning. Some districts assign a district-level coordinator who works with multiple schools. In Chesterfield County Public Schools, Va., for instance, where several schools offer courses through VHS, one district-level coordinator supports all of them. In other instances, each school has its own coordinator, often a current teacher or counselor who has been asked to pick up additional responsibilities.

Evaluating Site Coordinators' Support and Drawing on Coordinators' Knowledge to Improve the Program

Because site coordinators play a critical linking role between programs and local schools, it is important to ensure that these coordinators receive the support they need to be successful. Several of the programs profiled in this guide conduct regular surveys of site coordinators and other key parties (e.g., principals and teachers) to monitor the effectiveness of their communication with and support of coordinators.

VHS contracts with a nonprofit education organization, Learning Point Associates, to conduct a biannual evaluation and measure VHS's progress toward meeting program goals. In the most recent evaluation, encompassing the 2004–05 and 2005–06 school years, 96 percent of the site coordinators responding to the evaluator's survey reported that they were "satisfied" or "very satisfied" with support services, including the technical and procedural aspects of course enrollment. However, they did suggest additional assistance in recruiting students. And both site coordinators and teachers wanted VHS to facilitate more communication between them and VHS.

Site coordinator surveys also can be used to improve the overall program. IOAPA uses its

site coordinators as key resources for understanding the larger context of advanced course work in Iowa districts. Survey responses of 180 site coordinators painted a picture of varying district practices for labeling advanced courses and different grading policies. Overall, responses identified a trend toward more AP courses; however, they also identified several barriers to AP enrollment and success, including students' anxiety about the workload and lack of general study skills.[26] By understanding the district policies and contexts more fully, IOAPA can plan better student supports and encourage districts to establish or clarify policies to improve students' success in advanced courses, both in school and online.

Ensuring Quality of Advanced Courses

A district or school that has mapped its current curriculum against students' needs and interests is ready to investigate online providers to find out what advanced courses are available and the quality of each provider's course design and review process. For its part, the online provider must be attuned to the market, understanding what courses are likely to be needed by districts and schools and then creating or brokering engaging, high-quality courses to meet those needs.

Looking for Appropriate Design and Review

Quality instructional design is critical for any course, whether offline or online. In considering online providers, districts and schools must feel confident that quality courses are provided. They will want to be sure that courses align to relevant academic standards and are updated as needed to ensure currency of pedagogy and content. This latter is especially important when talking about certain kinds of advanced courses (e.g., astronomy) for which aspects of the content must be changed as new research or discoveries are made (e.g., Pluto's removal from the list of planets). Districts and schools also will want to consider the degree to which online courses can be characterized as "low-tech, high-touch," meaning they are delivered over the Web, using accessible, easy-to-manage information technology tools, while at the same time offering plenty of opportunities for student-instructor and student-to-student interaction.

Each program highlighted here has a documented process for creating or selecting high-quality courses and ensuring their alignment to state and national standards. When creating a course, they engage content experts, specialists in online pedagogy, editors, and other educators (e.g., school and district administrators). They also tend to adhere to course-development guidelines, either their own, those issued by the National Education Association (NEA) in 2002,[27] or a combination of both. Another set of guidelines became available in late 2006, when the Southern Regional Education Board (SREB) issued *Standards for Quality Online Courses*,[28] which addresses content and technology issues, as well as instructional design, student assessment, and course evaluation and management (see Standards for Quality Online Courses From the Southern Regional Education Board on p. 21). Even though the standards were developed for SREB member states, they are universally applicable and can serve as a useful reference point as a school or district searches for a good course provider.

Standards for Quality Online Courses From the Southern Regional Education Board

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.

- 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.

- 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.

- 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.

- 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.

- Standard for c*ourse 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.

Some providers rely solely on certified, classroom-based teachers to develop their courses, an approach sometimes referred to as a distributed course-development system. VHS has put together course-design standards based on a combination of the NEA guidelines and those of its own well-established professional development program, which certifies teachers for online instruction. Once a teacher has developed a new course, which also must be

based on national curriculum standards (e.g., the National Science Teachers Association's science standards, the National Council for Teachers of Mathematics' mathematics standards), the course is reviewed by VHS's curriculum coordinators and then aligned to the state standards associated with the member school.

COL relies largely, although not exclusively, on classroom teachers to develop its courses. Ninety-five percent of its courses have been developed by certified Colorado teachers through COL's Quality Assurance Program (QAP), with the other 5 percent coming from a third-party provider (i.e., a course provider other than the one directly partnering with a school or district, in this case, COL). Under QAP, a Colorado-certified teacher who wants to develop a course submits a course outline that includes suggested grade level for the course, course prerequisites, necessary skills and aptitude for student success in the course, a course overview, learning objectives, specific Colorado standards that the course will address, learning activities, and the estimated cost of materials. Once an outline is approved, the instructor develops the course following COL's guidelines, which, like VHS's, are influenced by the NEA guidelines.

The first draft of the course is reviewed by COL's director of online instruction, a specialist in online pedagogy who leads the QAP and also oversees regular review of existing courses to ensure they remain current. When reviewing a proposed course, this specialist checks to make sure the instructor addresses multiple learning styles; incorporates active-learning components; uses appropriate instructional design, tools, and software; and builds in opportunities for students to collaborate—all aspects of development that are especially important for advanced course work. COL also contracts with external content experts to review courses, both those in development and existing courses that may need updating. COL's board of directors makes final decisions about which courses go in the catalog, based on how courses score on the following criteria:

- Courses are aligned to state standards, and learning objectives are easy to find and understand;
- Visual appeal is created through the use of graphics and animation;
- Appropriate rigor and richness of content are integrated throughout the course;
- The technology works well, and there is evidence of appropriate use of software; and
- Supplemental materials (e.g., links to relevant Web sites, current journal articles) enhance the course.

While COL and VHS each use a type of the distributed course-development system described earlier, FLVS and CTY maintain course developers on staff. FLVS uses a blended approach: Its courses are developed primarily by an in-house team of curriculum and instruction experts, who collaborate with Florida educators if additional content expertise is needed during the course-development process.

Three of the highlighted providers—COL, MVS, IOAPA—license AP courses from third-party providers who, in order to designate a course as "AP," must first submit it to the College Board for approval through its course audit system.[29] In licensing AP courses from others, these providers look for a course-development process similar to their own. They then create review

teams to examine the courses for quality and alignment to relevant standards. For example, IOAPA licenses online courses from third-party provider Apex Learning, which has in-house staff dedicated to developing quality courses aligned to national and state standards. Like a number of third-party providers, Apex promises continual updating of its AP courses to keep them in line with any content or standards changes made by the College Board, and as of mid-2007, all of IOAPA's Apex courses were approved through the College Board audit process. In addition, it offers technical support and instructors who are Iowa-certified teachers.

MVS licenses AP course content from several third-party providers, including Apex, the Monterey Institute of Technology and Education (MITE), and one of the providers highlighted in this guide, FLVS. The licensing process requires these vendors to demonstrate that their courses align to Michigan standards. In an effort to build the capacity of Michigan teachers to teach rigorous courses and rely less on third-party providers, MVS has undertaken an aggressive two-year initiative to provide highly qualified, Michigan-certified instructors for all of its AP course offerings.

Online providers must review all courses regularly to keep them current with state content standards and, in the case of AP courses, with any revisions required by the College Board. (Although IB's online courses are only in the piloting stage now, the same type of updating will eventually be required for its courses.) FLVS, for example, revises one-third of its courses every year so that all courses are updated at least once every three years. One FLVS instructor noted that a key aspect of course revision is keeping examples and graphics up to date, because students can be distracted by dated material, such as a reference misidentifying a past U.S. president as the current president.

In considering available advanced courses, district and school decision-makers should look for iterative and well-documented course review processes. They also should look for alignment of courses to their local and state standards and for engaging delivery technology.

Considering Teacher-Student Interaction and Course Pacing

Because different students have different learning needs, schools will want to pay attention to two important variables in the design of any virtual course: the degree and type of interaction between and among students and instructor and the degree of flexibility in course pacing. Although both variables should be considered irrespective of the type of course being offered (e.g., core, advanced), for a district or school attempting to broaden the range of students taking advanced courses, these factors are especially significant. Students who are new to college preparatory courses or who work more successfully within a structured environment may profit from having more interaction with their instructors and having less flexibility about when they must complete assignments.

Teacher-student interaction. Online courses incorporate varying degrees of *asynchronous* and *synchronous* interaction between students and instructor and among students. Asynchronous interaction occurs when there is no real-time communication between students and instructor or among students; the instructor typically posts

assignments, lectures, support materials, and instructions online, and students can log in at any time to do their work. When students have questions they can e-mail their instructor or post a message to the instructor (or fellow students) on a virtual (i.e., online) class discussion board; the instructor and other students respond in the same manner. Most of the programs featured in this guide require their instructors to respond to students within a specific time (e.g., within 24 hours).

Asynchronous does not mean that students do not interact with the instructor. They just do not do so in real time, which gives them more flexibility in terms of fitting a course into their schedule. When a course is completely asynchronous, as are many AP courses, students might interact with instructors exclusively via e-mail or discussion board postings. But such a course can be highly structured, with many due dates and a lot of feedback from the instructor. For advanced students who are very motivated and organized, especially those who are trying to fit an additional course into an already busy schedule, working in this fashion can be appealing in that it allows them to work at their own pace and on their own schedule within certain parameters (e.g., all work must be completed within a prescribed period). But such semi-independent study is by no means the right choice for all students, including, for example, those who are new to the rigor of college prep courses and may not yet have a lot of self-confidence, whose learning style is such that real-time interaction with the instructor is important, or who are simply less organized or motivated. For these students, a greater degree of synchronous communication may be desirable.

Synchronous interaction occurs when participants (e.g., students with an instructor, students with each other) are online at the same time or otherwise connected (e.g., by computer and phone) with the intention of communicating in real time. Synchronous interactions can be built into courses through chat rooms and other forms of instant messaging and by scheduling "open classroom" time, during which the instructor is online explaining or modeling something and students can ask questions or discuss what is being taught. Instructors can also establish "office hours," during which they are available to converse online or even by phone with individual students.

Students in CTY's mathematics and science courses can move through online lessons or text chapters at their own pace, communicating with instructors asynchronously via e-mail or synchronously over the telephone (see Course Materials for Online Learning, p. 29). But, like advanced calculus student Lisa in the vignette entitled Getting Connected in an Online Course on page 25, if a student has questions and wants to communicate in real time with the instructor, or vice versa, either one can e-mail the other to schedule an online meeting. For the meeting, they communicate synchronously using an interactive whiteboard application that essentially serves as a form of graphical instant messaging. If the teacher decides that enough students are asking the same questions or have the same difficulty understanding certain concepts, the teacher can schedule an informal online meeting, very much like a college professor initiating an informal review session that students can decide whether or not to attend. This whiteboard application is particularly helpful for communicating about math and science because it allows users

Getting Connected in an Online Course

Lisa is a freshman at an inner-city high school in the Southwest. She has scored exceptionally high on her state achievement test and consistently ranks in the top 5 percent of her class. Unfortunately, her current school does not have the resources to offer a gifted-and-talented program or advanced courses on-site. Throughout Lisa's education, guidance counselors have suggested allowing her to skip grade levels in order for her to be more challenged academically, but Lisa's parents have preferred that she stay in class with her peers, students with whom she has grown up and to whom she feels close due to shared interests and activities.

Eager to give Lisa an opportunity to work at her highest potential, her high school guidance counselor began researching alternative programs for students considered to be gifted. The counselor discovered an online provider that specializes in offering supplemental advanced courses. Its courses are based on achievement standards specifically geared toward accelerating learning and also are aligned to both state and national standards. After discussions between the high school principal and the district's director of instructional technology, a decision was made to count online course credits toward the district's graduation requirements.

Excited about the new opportunity, Lisa decided to enroll in an advanced calculus course. She would continue to report to her current math teacher at the beginning of class and then go to the school's computer lab. As with some of her regular classes, Lisa had nine months in which to complete the course, but she also could choose to move through the course more quickly. During the first week of the course, Lisa's online instructor called her on the phone to introduce himself, and he also spoke with her parents. He said it was important for Lisa to remember that there was a human instructor on the other end of her online learning experience. He directed her to the main Web page for the course that listed his office hours, phone number, and e-mail address.

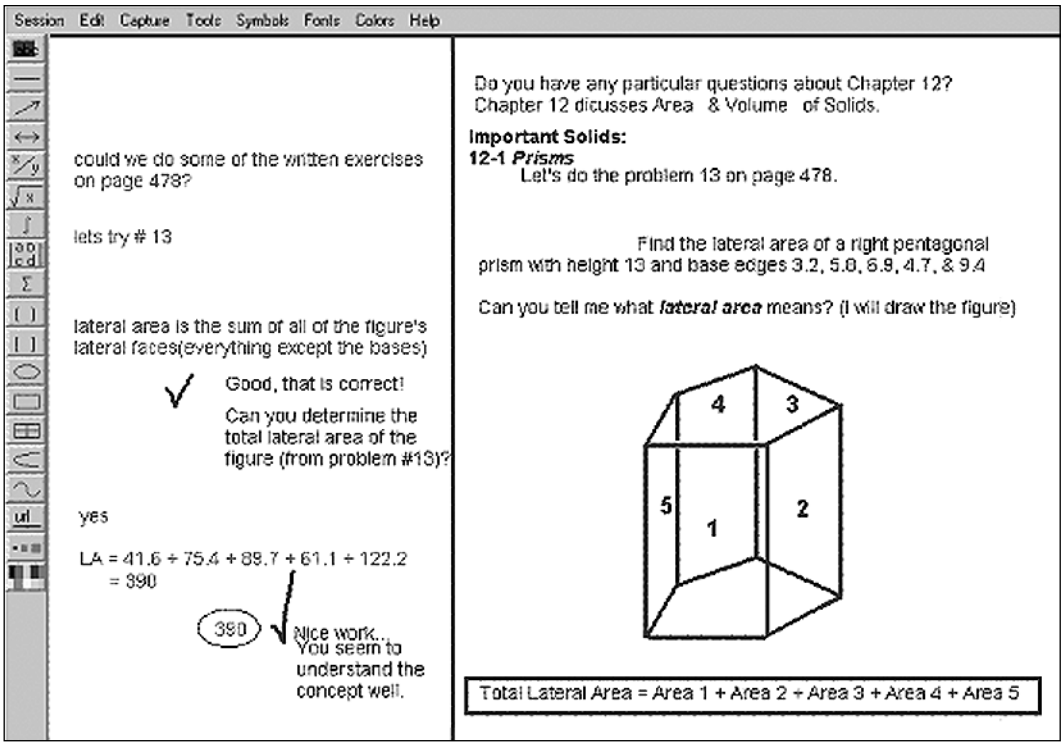
In addition to being able to access an electronic calculus textbook through the course's learning management system, Lisa received the textbook on CD-ROM as a back-up. If she needed extra assistance in order to understand a concept or math problem, Lisa would set up a "live" meeting with her instructor, using the electronic whiteboard for a form of instant messaging. The whiteboard gave both the instructor and student an ability to work out problems as if they were in a bricks-and-mortar setting. Lisa found this feature extremely useful. Through an instant messaging chat room that had been set up for the course, she also had a chance to communicate with online classmates. She enjoyed meeting students from other states and even another country.

Lisa completed the course in five months, and has since decided to enroll in the provider's creative writing course.

to draw, which can be useful when discussing equations and graphs or sharing schematics and diagrams. It also allows users to download and share calculator screen shots. For a look at a screen shot from an interactive whiteboard, see figure 2 on page 26.

Online providers are increasingly infusing courses with a combination of asynchronous and synchronous interaction, with students doing much of the work on their own time, but also being required to interact with their classmates and the instructor. Providers take various approaches to ensuring student-to-teacher and student-to-student connections, irrespective of whether those connections actually happen synchronously through a chat room, for example, or asynchronously through means,

Figure 2. Screen Shot Example of Interactive Whiteboard Used by Johns Hopkins University—Center for Talented Youth for Synchronous[a] Teacher-Student Interaction



[a] Here, synchronous interaction means teacher and students are online at the same time.

Note: The text on the right side of the screen and the text next to the checkmarks are from the instructor; the other text is from the student.

such as an online discussion board. One way of encouraging such connections is to organize course content into modules (i.e., discrete units of closely related content) with scheduled interaction (e.g., whole-group discussion, instructor-student conversation) at the end of each one. For example, FLVS's instructors (who serve approximately 100 students per semester with each student working at his or her own pace) schedule a telephone or online interaction when a student has completed a course module. In these voice-to-voice or online conversations, the student will offer feedback on the content and assignments and the instructor will respond to any questions the student has. Additionally, FLVS uses Elluminate, a Web conferencing tool that brings students and instructors together in synchronous interaction. Both students and teachers have indicated that they enjoy using the tool for such activities as guest author chats, tutoring, and remote induction ceremonies into FLVS honor societies.

Especially when faced with more challenging content, some students will profit from functioning as part of a student cohort, with opportunities

to participate in real-time classroom discussions. These discussions are modeled after the same experiences students will encounter throughout their adult lives, as they are required to collaborate or otherwise interact with colleagues in order to brainstorm ideas or find resolutions to various problems. Likewise, participating in these classroom discussions helps students develop valuable interpersonal skills they will need in order to communicate effectively in relationships and in society in general. In classroom discussions students also are exposed to different perspectives and ideas, and they are able to ask and answer questions of their peers as well as their instructor. Some providers build in connections by creating a cohort of students for each course (rather than having instructors serve students on an individual basis) and by limiting the size of that cohort. For example, VHS limits class size to 25 students per instructor so that students have greater opportunity to interact with their instructor and students in their class.

To help students develop connections and a sense of community with peers, who may be relatively far-flung, VHS also has incorporated student-centered discussions and activities into each course. For example, all VHS courses, irrespective of content area, start with the same assignment: By the end of the first week, students must submit a brief written description of themselves. During the second week, each student must review the descriptions of three other students and give feedback to each one. Then, in the third week, each student must review and respond to the feedback he or she has received. In addition to serving as an icebreaker and helping students get to know their online peers, thereby preparing them to participate in online discussions, the assignment helps ready them to provide peer feedback on subsequent assignments. For students who have only recently begun thinking of themselves as college-bound and who might otherwise be hesitant to speak online, this kind of activity can be especially helpful. Some providers actually quantify student interaction requirements, telling students, for example, that each must post a minimum of five online questions during the course and also must respond at least five times to other students' questions.

At both IOAPA and VHS, online instructors facilitate group activities among the students, very much like teachers in a traditional classroom might do. At CTY, in addition to holding online dialogs with their students, writing instructors require students to critique each other's work. Even for its math and science courses, which allow students to progress at their own pace within certain broad parameters, CTY has set up discussion forums to encourage student-to-student communication.

Course pacing. Many online courses are designed to offer flexible pacing, allowing students to move as quickly or slowly as they wish within some broad parameters. For example, MVS offers a series of completely self-paced classes called "Flex courses." Students can enroll in these courses anytime from early September to mid-October and, once enrolled, they have 90 days to complete the course. Instead of setting due dates for assignments, instructors set guidelines for completing assignments (e.g., half the assignments should be completed within the first 45 days of the course period).

CTY's math and science courses are designed with a similarly flexible pace. Students enroll in

three-, six-, or nine-month time increments and at no extra cost they can take as many courses within the time period as they think they can complete. Working at his or her own pace, a student may choose to use the entire enrollment period of three, six, or nine months to complete just one course or may decide to take multiple courses. Students also can take breaks from the course for family vacations or other events, suspending their enrollment time during the break.

On the other hand, providers also offer courses taught within traditional classroom timing parameters. Students are assigned due dates for homework and quizzes, and tests are scheduled regularly. For example, IOAPA's AP courses follow a semester schedule. One-semester courses are available in both the fall and spring; all other courses are two semesters in length and start only at the beginning of the fall term.

Some students, especially those who are highly self-motivated and very well organized, may find that a completely asynchronous, self-paced course is exactly what they want (although all students have access to an instructor as needed). At the other end of the spectrum are students who seek out an online course in order to get needed content, but also need or simply like the routine of a regularly scheduled "class" with assigned due dates for class work and assessments. So in considering online providers, if possible, districts and schools may want to look for one that offers multiple options to meet diverse student needs for interaction and course pacing.

Evaluating Online Courses

Even with systematic course development and review practices in place, online courses must be evaluated in the field, with the teachers and students using the courses. Programs often survey teachers, students, and other stakeholders, such as parents and site coordinators, to find out how courses are received. FLVS, for example, includes in its surveys a major section on course rigor and quality. The FLVS surveys are conducted on contract by Optimal Performance, a commercial research organization. Tracking survey responses over time, FLVS finds that results have remained consistent over four years of data. Selected results from the most recent report follow.[30]

- Students reported spending about the same amount of time on their FLVS course as students did in a school-based course.
- When surveyed about the level of difficulty of their FLVS course compared to a traditional high school course, 27 percent of students responded that their FLVS course was "harder" or "much harder." Thirty-six percent of students indicated their FLVS course was the same level of difficulty as a traditional class, and 21 percent reported that their class was "easier" or "much easier." However, many who found their online course to be easier felt this was because of some of the qualities that are built into FLVS courses, such as the extra one-on-one attention provided by teachers, the ability to resubmit assignments in order to learn content, the lack of disruptions when working from home, the self-pacing structure, or some combination of the above.
- When asked to compare the quality of their course with their traditional classroom experiences, most students (48 percent) said it was "better" or "much better," and another 30 percent indicated it was of the same quality.

Course Materials for Online Learning

Textbooks. When online courses require textbooks, providers often create links to online stores that can mail the book to the student or school directly. But, increasingly, traditional books are being replaced with e-text and other posted materials. E-text can be enhanced with audio and video streaming and by animation and other visual features. For example, COL's German-language instructor records himself giving a lecture and the video is posted on the course Web site, along with the text. Students then watch and listen to the instructor in the upper left-hand corner of their computer screen even as they click on e-text links to the right. An AP instructor for FLVS values the ability to post Web links and other documents tailored to students' questions as she receives them.

CTY uses third-party provider Thinkwell's electronic textbooks (see fig. 3 on p. 30) for some courses. Like most standard textbooks, each section of Thinkwell's texts also ends with a quiz, and the chapters, themselves, end with a comprehensive assessment. Instructors tailor the courses to match the needs of students by adding resources and assignments, selecting topics, and changing the order of the content in the electronic textbook. In addition to being able to read the textbook online, CTY students receive a CD-ROM version, via ground mail. The CD version ensures that even if they were unable to access the Web site at any time during the course, they could still read the material.

Science labs. For its AP science courses, the College Board has traditionally required that students participate in a hands-on laboratory component supervised by a qualified science educator (e.g., at their school, at a nearby college), as opposed to having students participate in a virtual or computer-simulated lab experience. So at Northwood-Kensett Junior-Senior High School, in Iowa, for example, students complete the lab work for an online AP chemistry course by conducting experiments with a science mentor during the school day. However, at the time the study for this guide was underway, the College Board had opened the door for the possible use of virtual labs for online AP science courses. Under its current policy, schools that choose to develop their online AP science courses with laboratory experiences that are virtual or that include a combination of virtual and hands-on investigations may request authorization to label these courses AP. Their proposed lab experiences will be evaluated by an independent panel of college faculty against the learning objectives of its related course. If the panel determines that the simulated lab develops the same skills as would a hands-on lab and, therefore, meets the course's learning objectives, the course, with its online lab component, may be approved to use the AP designation.

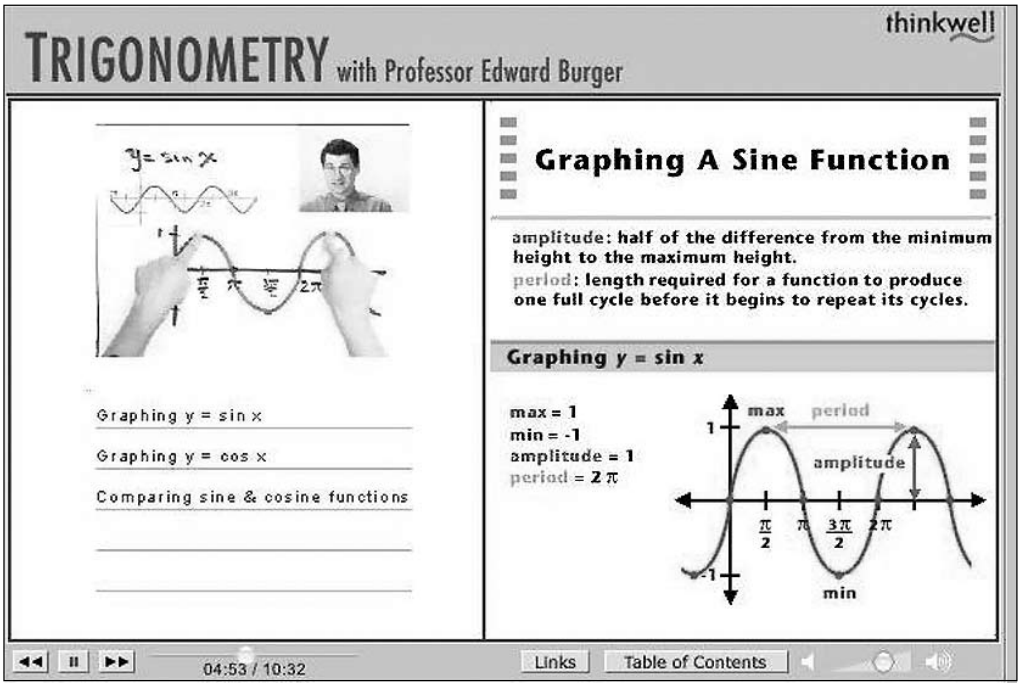
For its own science courses, CTY currently is investigating creating hard-copy lab packets that would be mailed either to a student's home or to school so students can access lab materials easily. The labs would then be completed under the supervision of a parent or science instructor.

FLVS also asks parents about course quality and uses parent responses, along with those of teachers and students, to ensure that they are getting a complete picture.

In its surveys of teachers, VHS also probes about the nature of the learning experience. As a key indicator of course quality, teachers are asked if students "become engaged in their course work." For 2004–05 and 2005–06, roughly 80 percent of teachers agreed or strongly agreed that students became engaged, and also that students participated in collaborative learning.[31]

Following the 2005–06 school year, approximately 95 percent of the 110 school principals who responded to VHS's survey said they were either

Figure 3. Interactive "Page" From Thinkwell[a] Online Trigonometry Textbook Used by Johns Hopkins University—Center for Talented Youth to Provide Dynamic Alternative to Static Hard-copy Texts



[a] A third-party provider

Note: When students are looking at this "page" online, they see and hear the textbook instructor talking in the area of his photograph, and they see his hands and fingers moving as he explains or demonstrates a concept. They can see a problem solved once and, if they need to, can watch it being solved again. (The instructor featured in the online textbook is not the same as the instructors who teach online trigonometry courses and who might use the textbook. As the publisher of the online textbook, Thinkwell hires university professors to deliver textbook content, whereas course providers hire their own instructors to teach online courses.)

"very satisfied" or "satisfied" with the quality of VHS course offerings.[32]

Seeking and Supporting High-quality Instruction

Ensuring high-quality teachers is important in any educational setting, whether in the traditional classroom or in an online learning environment. While many traditional schools lack the capacity to train or the resources to hire instructors for advanced curriculum, when they partner with an online course provider, the provider is responsible for ensuring that instructors are effective and qualified. Thus, when seeking out advanced course work from an online provider, school and district leaders will want to inquire about initial instructor preparation, ongoing support available for instructors' continued development, and evaluation of instructor effectiveness. District and school leaders interviewed for this guide suggest looking for providers that invest in all of these areas.

Selecting and Training Instructors

For the providers highlighted here, online instructors are usually regular classroom teachers who teach online courses part time. To teach for these providers, instructors have to meet certain expectations and requirements.[33] It is important to note, here, that these highlighted providers fall into one of two broad and sometimes overlapping categories: those that deliver courses almost exclusively to students in the provider's home state (i.e., COL, IOAPA, MVS) and those that deliver courses to students in other states (or internationally) as well (i.e., FLVS, CTY, VHS). The two types of providers often take different approaches to instructor selection.

Under the *No Child Left Behind Act of 2001* (NCLB), online instructors, like all K–12 teachers, must be highly qualified. Each of the state-based providers featured in this guide requires instructors to be certified in the content area in which they teach *and* in the state served by the provider (e.g., MVS instructors must be Michigan-certified and highly qualified). On the other hand, providers serving students in multiple states (e.g., VHS) would find it prohibitive to require instructors to be certified in every state where their online students are located, so they have slightly different requirements. VHS, for example, requires instructors to be certified in the subject area of the online courses they teach, but it does not matter in which state they are certified. As it happens, 85 percent of VHS teachers also hold master's degrees and 19 percent of those also hold a doctoral degree or other additional credentials. At CTY, K–12 instructors are not required to be state-certified teachers, but they must have earned at least a bachelor's degree in the content area they are teaching; most of them have advanced degrees, including Ph.D.s, and have had proven success in that field of study in addition to online teaching experience. For example, CTY writing instructors are published authors and several of its instructors have extensive experience with online learning in the corporate environment.

Instructor training. Online instructors should be skilled in learning theories, relevant technologies, and teaching pedagogies appropriate for the online environment. SREB's *Standards for Quality Online Teaching*[34] recognizes that while the skills needed for online teaching are largely the same as those needed for success in a traditional classroom, some skills are even more important in the online environment. For example, a teacher's ability to communicate effectively in writing, important in a traditional classroom, becomes essential in an online course where virtually all communication is likely to be in writing.

Some providers, like COL and IOAPA, do not offer any training for instructors, instead requiring that candidates have all necessary skills. As a very small program with a small staff, COL simply does not have the resources to train online instructors. However, its board of directors, which includes pedagogy and instructional technology experts, has the final say on who is accepted to teach in the program. The application itself asks specific questions about how the instructor will deliver the course online and interact with the students, and candidates must answer in short essay format. They also must provide specific examples of assignments they have developed and their instructional techniques. Additionally, instructors are required to be Colorado-certified and hold a degree in the subject area. Once hired, they receive an

orientation and have access to the help desk of the platform provider, which in COL's case is eCollege. For its part, IOAPA does not offer its own training because it primarily licenses courses from Apex Learning, which has its own professional development program for its instructors. IOAPA is an example of a program that licenses courses from a third-party provider so it does not need to create an infrastructure to either develop courses or train instructors.

VHS, FLVS, and MVS, on the other hand, have created and manage their own internal development programs. At VHS, for example, instructors must successfully complete a 10-week online professional development program before teaching their own course. Even so, as they teach their first course, all new instructors work with an experienced facilitator, who serves as a mentor and demonstrates how to prepare online resources, lead group discussions, and grade assignments. According to VHS's new-teacher survey for 2005–06, 42 out of 44 new VHS instructors said that the professional development program was "very effective" or "somewhat effective" in helping them plan and implement a VHS course of their own, 41 said the training helped them use technology while teaching, 35 said it helped them foster online group activities, and 37 indicated that the professional development helped them effectively generate online discussions among their students.[35]

FLVS takes a different approach, hosting a two-day, face-to-face training session for its new instructors, after which the instructors also must complete a 12-hour online class (over the course of one or two weeks) prior to teaching. Among other things, the online course familiarizes them with the FLVS online system and teaching tools. Once they start teaching, new instructors are partnered with a mentor, who is a more experienced online instructor with whom they meet weekly for the next year. Both of these professional development (PD) programs are constantly tweaked based on teacher and other stakeholder satisfaction survey reports about the effectiveness of the PD courses, as well as the effectiveness of the instructors after they receive the training.

CTY instructors receive training from their regionally based instructional supervisors, who serve as mentors and liaisons between instructors and CTY. CTY instructors are already highly qualified in terms of subject area, but the supervisors see to it that instructors are interacting with students and understand how to use the various platforms and software. Additionally, supervisors conduct instructors' performance reviews.

Supporting Instructors to Ensure Effectiveness

Like their students, online instructors require support in order to perform optimally. FLVS provides this support through its instructional leaders, of which there is one for every 50 to 60 online instructors. Among other things, an instructional leader monitors instructors' communication logs, and if it becomes apparent that an instructor is not reaching parent-contact goals (i.e., not adequately keeping in touch with the parents of online students), the instructional leader may contact the instructor to inquire about needed support or may assign another more seasoned instructor to serve as a peer mentor and help the instructor increase call volume. Additionally, FLVS has three learning community leaders who each oversee six

instructional leaders. Cross-team content area managers also are assigned to support instructors by regularly communicating about course updates (e.g., addition of new content, modification of existing content) and sharing information about the latest instructional tools or supports (e.g., listing links to helpful Web sites, describing techniques for engaging students, proposing ideas for group activities). In 2007, FLVS also implemented a "co-teaching" model, which pairs two full-time instructors with an adjunct (i.e., part-time) instructor. The adjunct instructor provides additional student support, allowing teams to participate in more professional development opportunities.

MVS provides extensive instructor support facilitated by an instructional manager, who is similar to the FLVS instructional leaders and the CTY instructional supervisors. To help manage and mentor new instructors and maintain consistency within each subject area or department, MVS also has created the position of department chair for each subject area. These individuals support new instructors and familiarize them with the platform used in the courses. The instructional manager stays in contact with the department chairs and also handles all requests for professional development.

CTY instructors are supported by instructional supervisors, each of whom works with approximately 10 instructors. CTY also gives instructors a handbook with tips and resources for handling issues that can arise in an online environment (e.g., technology problems, providing encouragement for students).

VHS instructors receive ongoing professional development and support through the online Community of Virtual Educators (COVE). Each VHS instructor creates a personal professional development plan and has access to a variety of trainings given online by COVE professional development staff, referred to as "lifeguards." Any changes to the platform used to deliver courses (e.g., introduction of a new online grade book) also are communicated through the COVE, with the lifeguards helping instructors to understand the new features.

Both MVS and FLVS have implemented a lead teacher role for the instructor who has developed an individual course and teaches its initial section. As more sections are added, this instructor guides and supports those who teach additional sections.

Evaluating Instruction

Each provider featured here monitors instructor performance to ensure that students are being adequately supported in the online classroom. MVS teachers are required contractually to respond to e-mails from students and site coordinators within 24 hours, to grade assignments within 48 hours, and to grade tests within 72 hours. Instructors are informed at the beginning of their contracts that all such actions will be monitored by MVS's online course management system, which also will monitor each student's progress. MVS has a formal instructor evaluation process, which includes a short, electronic student survey administered on completion of each course. Students are asked very specific questions related to their instruction, for example, "How would you grade the communication and responsiveness of your teacher?" Feedback is sent directly to the instructional manager, with only the aggregate information given to the instructor. The

instructional manager combines all the data from the student and teacher surveys, tracking these data by department and individual courses.

FLVS leaders regularly examine instructor performance. FLVS instructors are required to make monthly contact with parents of online students. They log each effort (e.g., completed call, attempted call, e-mail message) so they and other FLVS staff (e.g., managers) can monitor their performance. FLVS focuses on this aspect of instructor responsibility because, in conducting internal pilot studies about the relationship between voice-to-voice contact and student success (looking at the effect of teachers who made frequent calls versus those who made no calls), the provider found that the voice-to-voice contact correlated with a higher degree of student success.

During instructors' first semester of teaching, VHS mentors submit regular evaluations of the new teachers to the VHS curriculum coordinator. Based on these evaluations, the mentor and the curriculum coordinator then decide whether new teachers need to continue being coached during their second semester of teaching. When a new teacher needs continued mentoring, he or she is said to be "retained in coaching." During the 2001–07 school years, the percentage of new teachers retained in coaching generally fluctuated between 12 and 17 percent. The one exception was the 2005–06 school year, during which 22 percent of teachers were retained in coaching.

Recruiting and Readying Students for Advanced Courses

For students, the quality and effectiveness of the online learning experience depends not just on the courses themselves and the quality of instruction, but also on how smoothly the overall online learning program is implemented at their school site and whether they receive needed preparation and support.

Recruiting Students for Advanced Course Work

Building awareness about the availability of advanced courses is a chief responsibility of a district's or school's site coordinator. While some students are naturally drawn to advanced course work when they hear about it, others may need encouragement from their parents or counselors. Thus, there is a need to inform these two groups as well about online opportunities for their students.

Provider role. Online providers support recruitment by first making sure districts and schools fully understand online learning and how such courses can benefit students. To do this, FLVS leaders, for example, employ a group of three regionally based public affairs liaisons who visit Florida community organizations and faith-based groups. Additionally, there are four regionally based external school counselors who visit districts and schools to inform them about FLVS courses. Similarly, MVS employs part-time regional "ambassadors" who each spend 15–20 hours a week giving presentations to nonparticipating schools and keeping in touch with member schools. VHS staff work directly with school decision-makers (e.g., superintendents, principals, curriculum coordinators, department heads, teachers) to describe the educational benefits of online courses, highlighting VHS's AP exam participation and passing rates. IOAPA works through an existing network of coordinators for districts' gifted-and-talented programs.

As a group, these individuals are well situated to recruit students to online learning because they work in multiple grade levels, work across school buildings, and understand the needs of high-ability students.

Providers also supply partner districts and schools with brochures, online demonstrations, readiness assessments, and other recruitment tools. CTY, for example, has developed direct mail and marketing materials (e.g., brochures, flyers, letters) for its partners to use. Because it only accepts students who meet its standards for being gifted and talented, CTY also provides its partners with a guide that delineates those standards, thus assisting counselors and district leaders with the talent search process.

Some online providers also try to connect directly with students and their parents to increase awareness of the online option. For example, CTY staff carry out recruitment activities through churches, synagogues, other family-centered organizations, and hospitals—anywhere school-age children and their parents are likely to be connected.

District or school role. Districts' and schools' general recruitment efforts for online students range from the broad to the increasingly specific. One Iowa school, for example, simply integrates available IOAPA courses into its annual course catalog. One Michigan school has guidance counselors visit classrooms at the beginning and end of each semester to talk about and explain the benefits of online courses. And the site coordinator at one Massachusetts school sends letters to sophomores who, left to their own devices, would not likely sign up or be ready for an AP course. The letter encourages them to take a pre-AP calculus course online. Most recently, the letter was sent to 50 students and yielded 25 enrollments.

Reaching Disadvantaged Students

A number of the providers featured in this guide make special efforts to recruit students who would be considered least likely to seek or have access to advanced course work. In this category are students who attend rural schools, small schools, or schools primarily serving low-income families; many of these schools simply do not have the resources to offer advanced courses. Also in this category are students whose schools may already offer advanced content classes but where limited course capacity has resulted in either explicit or unstated rules about who is and is not "qualified" to take such courses. Most likely left out are students who do not have a sterling academic record across the board (though they may be strong in one or more areas), who are off track in the sequencing of courses, or who for other reasons are not considered good candidates for college prep courses. Even if there is room in advanced classes, some students opt out on their own because they do not see college as a viable alternative in their own future and have not been told otherwise by the adults at their school or elsewhere. Such students are likely to come from families that do not have a history of going to college, or even graduating from high school.

In partnership with districts and schools, committed online course providers can help close these access gaps. In Florida, FLVS's interest in increasing participation by students from disadvantaged backgrounds has been reinforced by the state legislature, which has imposed some recruitment

and acceptance priorities (e.g., giving priority to students who attend low-performing schools or are disadvantaged, as defined by NCLB and the state of Florida). This provider has implemented a diversity initiative that directs staff to work through community- and faith-based agencies to actively recruit both minority students and students from low-income areas. During the 2006–07 school year, FLVS's five public affairs liaisons made contacts at more than 1,000 new venues within the community, which resulted in more Web site visits by potential new students than in previous years. FLVS also runs ads in school newspapers and hopes to broadcast public service announcements in the future. Recognizing that some courses will be oversubscribed and unable to immediately serve all students who apply, this provider has developed a weighted enrollment system that gives priority to minority students, students in rural or low-performing schools, those who are hospital- or home-bound, and seniors for whom just one online course will allow them to graduate.

Such efforts pay off. Starting in 1998, with funding from Goldman Sachs, CTY initiated an outreach program for Hispanic, African-American, and Native American students, increasing its staffing in minority communities and being more aggressive in its outreach. As a result, CTY increased minority enrollment from less than 3 percent in 1998 to 14 percent in 2005.

To support participation by rural students, whose schools typically are less likely to offer advanced course work, IOAPA has sought and received federal funding from the Iowa Department of Education, which received Advanced Placement Incentive Program grant funds and directed some of that funding to IOAPA. The money has been used for a variety of activities (e.g., funding course tuition, mentor stipends) at schools in which 40 percent or more of students are considered low-income.

In addition to this type of targeted outreach work by online providers, districts and schools have an important role to play in broadening the numbers and types of students who are encouraged or specifically invited to sign up for online advanced course work. Some districts researched for this guide have taken the lead by asking their middle school teachers to carefully consider who among their students might do well in advanced high school courses with appropriate preparation and support. Districts can ask the same thing of high school teachers and counselors. Either way, staff should be asked to "think outside the box," expanding their student identification efforts beyond just the obvious choices (e.g., proven self-starters with strong grades). Rather than starting from student grades or a profile of the hypothetical perfect student for online advanced learning, they will want to look carefully at the learning strengths, challenges, interests, and circumstances of individual students. For example, a student with learning disabilities may perform very poorly in one content area, such as language arts, while performing very well in other areas, such as mathematics and science. While the low grades in language arts result in a lower overall grade point average and may keep the student off the honor roll, he or she may be an ideal candidate for advanced course work in math or science. Similarly, a somewhat disengaged, but technology-savvy student who, to date, has been performing only adequately may become an enthusiastic and successful learner in an online environment due to his or her interest in technology. And what about the student who earned

high grades in middle school but fell apart during the first year of high school due to significant family problems, failing a core course? With the family problems resolved and with encouragement to make up the failed course during summer school (or online), this student might make great headway in advanced online courses.

Finally, no matter what teachers and counselors do to identify and recruit candidates for advanced online courses, school leaders at both middle and high schools also must remain focused on ensuring that all students master the knowledge and skills needed to score proficient or above on statewide assessments required by NCLB. To the extent that students can do so, they will be better prepared for taking advanced course work, whether online or off-line.

Alerting Students to New Expectations

All of the course providers highlighted in this guide recognize the importance of making sure students who decide to take an advanced course online understand what is involved and what will be expected of them. This is especially important for students like Zoe, in the vignette on page 38, who, because they have never taken either an advanced course or an online course, face the double challenge of adjusting to the increased demands of advanced content at the same time they adjust to a new learning environment and tools. Programs want students to have reflected on their own learning strengths and challenges prior to starting a course, the idea being that such self-reflection is itself an asset for any student in any learning experience. To this end, the programs provide site coordinators with surveys and other tools to use as conversation starters with interested students. Both FLVS's student survey, *Is Online Learning for Me*,[36] and COL's *Is Online Learning Right for Me*,[37] ask students to rate their attitudes toward learning and include questions about working independently, being proactive in their studies, using the Internet as a means of communication, their responsiveness to e-mails, and their access to technology at home. FLVS believes that with enough support any student can be successful in online learning; however, using a student's responses to the survey as a conversation starter helps prepare the student for possible challenges he or she may face in the online environment and gives both site staff and FLVS an understanding of how much support the student may need in order to succeed.

FLVS's online course expectations and the skills it considers important for student success are posted on its Web site and also are communicated by each district's or school's site coordinator during preenrollment counseling for students. Even so, once students are enrolled, online instructors like Zoe's reiterate these things in a "welcome call" prior to the beginning of the course. Parents and students can prepare for the call (e.g., know what questions to ask) by viewing an online video, "Preparing for the Welcome Call" (see fig. 4 on p. 39). During the call, the instructor is on the phone with the student and his or her parent(s), and all of them also may be online. The instructor talks the student and parents through the course Web site to help them understand how to log in, navigate the course, and post completed assignments. The instructor also shares tips for online success, such as staying on pace, reaching out when students need help, checking e-mail frequently, and carefully reading the instructor's comments.

Managing Student Expectations and Monitoring Student Progress

Zoe, a junior at a large urban school district, is the oldest of five siblings in a minority family. Her parents hope she will be the first in their family to attend college and set a positive example for her younger brothers and sisters. Zoe knows she will have to compete for college scholarships and is highly motivated to go above and beyond her high school graduation requirements. After filling her schedule with the required core courses, she realized her AP English literature course and orchestra period conflicted with the honors algebra II course she was hoping to take.

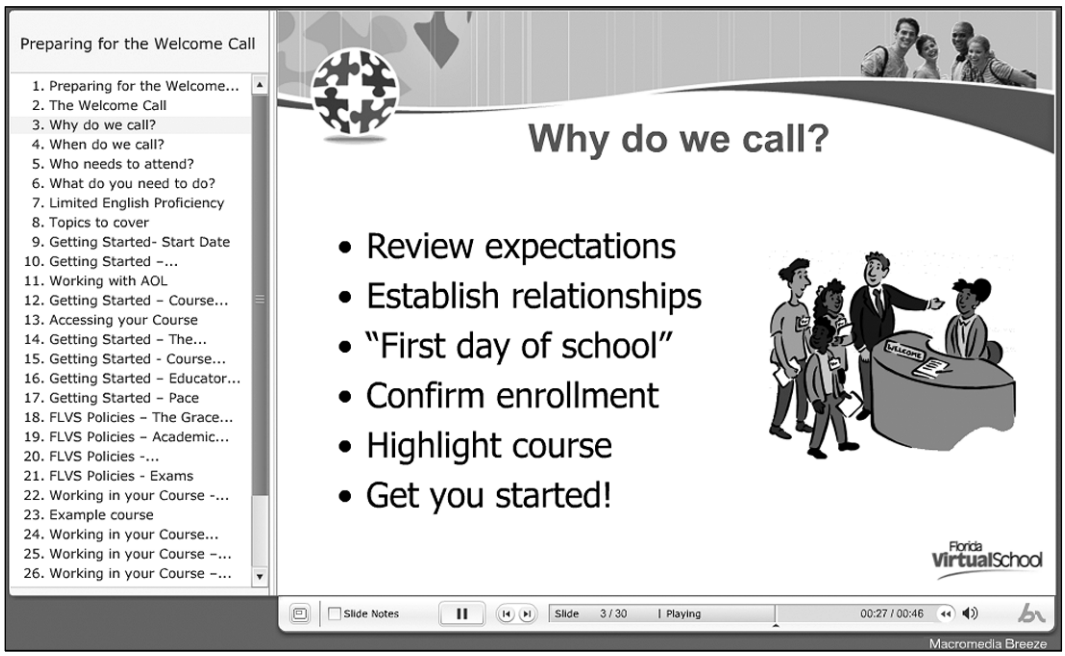
Zoe recalled her guidance counselor mentioning online course options during her orientation. She made an appointment with the counselor to learn what would be involved in taking an online course. After hearing more about it, she decided to enroll in an online honors algebra II course, which she could take during an independent study period. Zoe was excited, remembering a brochure from the program that showed a young girl saying how the online course experience had helped prepare her for college.

The week before her honors course was to begin, the online instructor called Zoe at home to speak with both her and her parents about specific course expectations and about the logistics of how the course would operate. Zoe had already gone over the online learning expectations with her guidance counselor but felt that hearing the specific course expectations from her instructor was very helpful. At the parents' request, the instructor also reviewed his own online learning and mathematics credentials to help assure them that Zoe would receive high-quality instruction. Once the course started, the instructor continued to contact her parents on a monthly basis to discuss their daughter's progress.

Currently, Zoe spends her independent study period at school logged into her online algebra II course. At home, in addition to completing homework for other courses, she may spend another 45 minutes online before she goes to bed, and she generally works from two to three hours online each weekend. If she does well in this algebra II course, she plans to ask her guidance counselor about enrolling in the online AP calculus course for her senior year.

Students who are interested in taking advanced courses (e.g., AP, honors) are vetted specifically for whether they are ready for the more challenging content. Past performance may be one indicator of readiness. But many staff interviewed for this guide look at a variety of other indicators. At one Colorado school, for example, the COL site coordinator requires students to submit a teacher recommendation and, also, to write an essay addressing how he or she plans to be successful in the course. IOAPA encourages site coordinators who are trying to determine if a student is ready for advanced courses to go to its Web site to read *Profile of Success for Students Taking AP Courses Via Web*.[38] Some of the traits that IOAPA considers to be common in high-achieving students are an enjoyment for being challenged, a tendency to assume significant responsibility for their own progress, a tendency to ask questions and seek out answers as needed, and an ability to appropriately prioritize their activities. The programs also ask site coordinators to gauge student readiness for online AP courses by using AP pretests. Generally speaking, if a student scores less than an 80 percent on the pretest, he or she is not considered ready for an AP course. At one Iowa high school, the site coordinator requires that students successfully complete algebra II before enrolling in an AP math course; the counselor then discusses with the AP teacher the student's level of success

Figure 4. Screen Shot From Florida Virtual School's Online "Welcome Call" Video That Gives Parents a Heads-up About What to Expect From the Call



in the prerequisite course. If a student is not considered academically prepared for the advanced course, he or she is counseled away from the AP course, perhaps into an honors course instead.

Preparing and Supporting Students for Advanced Courses

Advanced courses embody higher expectations for student achievement and also may require students to complete substantially more work than in a standard academic course. Many also include projects of greater complexity, such as conducting extensive independent research, gathering data from multiple sources and in multiple formats, and, ultimately, covering a subject in greater depth than a student would be expected to in a standard (i.e., non-advanced) course. Preparation and support, helpful for all students, are essential for those who may be underperformers at the time they are identified as candidates for advanced courses or express interest.

Preparing students. The rigor of their advanced courses has led four of the six highlighted providers to offer preparatory classes aimed at better ensuring students' success once they sign on for an advanced course. These preparatory courses include pre-AP, study skills, and prerequisite courses, such as algebra. VHS, for example, applied for and received funding from the U.S. Department of Education's Advanced Placement Incentive Program to develop an Online AP Academy. The grant enabled 52 low-income high schools to offer online AP

Preparatory Classes Lead Students Onward and Upward

Jamal is a high school sophomore at a large inner-city school in the Northeast. His school is a member of a national virtual high school that offers advanced content courses, such as Advanced Placement (AP) and foreign language classes. Before becoming a member of the virtual school, the district had been unable to provide its students with advanced courses or with much choice in foreign languages. During his freshman year, Jamal was enrolled in an online pre-AP course, which helped prepare him for the rigor of the AP calculus course he now takes.

His calculus course, limited to 25 online students, is designated as an independent study, and he is allowed to use the on-site computer lab during one class period every day. A lab monitor is available to provide technical assistance. Jamal also works on his online homework at home in the evenings. He usually finds at least one of his calculus classmates online at the same time as he is, which is helpful because they can use the classroom chat area to discuss homework and other upcoming assignments. Knowing that the instructor regularly monitors the archived discussions keeps Jamal and his friends on task during their online interaction.

In his end-of-course survey, Jamal said he enjoyed the relatively small class size of his online course and appreciated not having to deal with the typical classroom distractions. Jamal is a shy individual whose initial lack of confidence in his academic skills had kept him from participating in discussions in his school-based classes. He said being in a virtual setting helped him participate more actively in group discussions, which, in turn, helped him feel confident enough to participate more fully in his traditional classes.

courses and their feeder middle schools to offer online enrichment and pre-AP courses. Intended to ready students like Jamal, in the vignette above, to succeed in AP courses, Online AP Academy's 12 pre-AP courses are developed by vertical teams, made up of those who teach in the same content area, but at successive grade levels. The use of vertical teams helps ensure a seamless transition in learning and skills as students progress through higher grades. In addition to providing rich content, the pre-AP and middle school enrichment courses are designed to teach students study skills and to generate other positive academic habits.

One district that is partnering with an online provider to offer advanced high school courses has had all of its middle school students participate in an online course on critical thinking skills, delivered by the same provider. These students are then mentored during their first year in high school with the intent of readying them to start taking AP courses in the 10th grade.

Supporting students. All the provider representatives, district or school site coordinators, and online instructors interviewed for this guide agree that the students most likely to succeed in online courses are self-motivated, bring a take-care-of-business attitude toward completing their course work, and have good time management skills. Such attributes are readily evident in motivated students like Zoe in the p. 38 vignette, Managing Student Expectations and Monitoring Student Progress; they may be less obvious or not as highly developed in disadvantaged or underperforming students who have been actively recruited to online learning in general and advanced course work specifically. Yet irrespective of students' academic

history, if students express interest in taking an online advanced course, these highlighted providers and the districts and schools with which they partner will encourage them and, more to the point, will look for ways to support individual students to be successful. At one school in rural Colorado, for example, students who have not already demonstrated motivation in their learning but who want to take an advanced online course first participate in an independent study course under the supervision of the school's site coordinator for online learning; in this way, students practice and are coached in the skills needed for successful online learning. VHS found that one important way of supporting online students is to have instructors start providing feedback to students right away once a course begins. In the program's early stages, VHS instructors would first post grades approximately six weeks after the start of a course, but they learned that six weeks was too late because, by then, many low-performing students could not catch up. Now, VHS instructors post students' grades starting soon after the course begins, and every two weeks, they publish students' grade point averages for site coordinators to review. Two-week monitoring intervals keep students from falling too far behind.

Logistical support. At its most basic, student support starts with making sure that students have adequate time and space to successfully participate in their courses. Several providers recommend that school leaders designate a specific class period in the regular school day during which online students are encouraged to work on their assignments (although not required to, since many students are taking online courses because of needed scheduling flexibility). Providers of AP courses expressly suggest that AP students be given extra computer access time because for each AP course they take, students typically spend about 15 hours each week on homework outside the school day.

While the flexibility of online courses theoretically allows students to work anywhere and anytime, many students opt to do online course work at school during regular school hours. In Iowa, the majority of online AP students work on their course(s) during the school day. In Michigan, one of the member schools of MVS has two computer labs on campus used exclusively by students taking online courses during the school day. Many students participating in CTY also take their online courses in an on-campus computer lab during the school day. CTY officials believe social interactions with peers are critical elements for development, and online learning allows highly able students to obtain the advanced course work they need without having to leave the school environment.

To help students get their work done, many of the schools partnering with one of the highlighted online providers also give students computer time outside of regular school hours. For example, one Colorado school makes its lab available two evenings a week, as well as on Sunday.

In Florida, one district that has students enrolled in FLVS courses has launched an initiative to place computers in libraries and recreational centers around the community, with the goal of providing students a place to work on their online courses outside of normal school hours if they do not have access to adequate computer resources at home. The plan is for participating schools to refer online students in need of

an after-hours computer to one of these local community centers.

Recognizing that having adequate time and space to work means nothing if a student cannot get past the occasional computer glitch, most online providers have a "help desk" for their students. MVS, for example, operates its own help desk, which is open from 7:00 a.m. to 7:00 p.m., Monday through Friday, and on Sunday from 5:00 p.m. to 9:00 p.m. Originally, the help desk was open 24 hours a day, seven days a week, but after researching peak-time usage, the program determined the most cost-effective hours of operation. MVS officials say they have received no complaints from students or teachers since reducing the help desk hours. Companies that provide the platform, or framework, for running the course software (e.g., Blackboard, eCollege) may offer additional technology support, but partnering districts and schools should consider providing their own technical assistance as well. One district working with COL implemented a tiered-response system, whereby a student experiencing technical difficulty first contacts the site coordinator. If the coordinator cannot resolve the problem, he or she contacts the district's technical support person. If the problem cannot be resolved at that level, the coordinator contacts the program directly. If the program cannot resolve the issue, the problem is escalated to the platform provider.

FLVS's technology department manages the server, computer hardware, and software licensing for schools or districts using FLVS courses, and school site coordinators can call directly to report technical problems. Sometimes, however, students' difficulties can be caused by students' lack of access to appropriate hardware and software at home. The site coordinator at one school contacted local computer retailers and told the managers what the technology requirements are for online courses, in the event that students contacted the stores for equipment upgrades.

Mentors or counselors. Online providers recommend that districts and schools offer students extra support to encourage them to stay engaged and on task. Some high schools try to ensure that these individuals have as much content expertise as possible in the courses students are taking. For example, at Northwood-Kensett Junior-Senior High School in Northwood, Iowa, school leaders assign four teachers to mentor IOAPA students. The teachers are chosen based on the online courses students are taking at any given time. So at one point when students were enrolled in online U.S. government, English language and composition, calculus, and economics, they were mentored by social studies, English, mathematics, and business teachers, respectively. The school's guidance counselor will generally try to schedule an online student for the computer lab during the "off-period" of his or her mentor teacher so the student can get face-to-face help if needed. When mentors cannot address the student's question, they will suggest e-mailing or calling the online instructor for additional assistance and may enlist the help of the site coordinator to respond to student needs.

Some schools have two kinds of mentors for their online students, a classroom teacher who is available for more substantive questions and a technology-oriented person who stays in the computer lab and is available, minimally, to help with technology-related problems. At some schools,

the site coordinator assumes these roles. IOAPA also requires that mentors proctor the course tests at the school site rather than allowing the students to take these assessments online.

In Michigan, which in 2006 became the first state to require that students have experience with online learning prior to high school graduation,[39] the state department of education's pupil accounting rules require that every online student be assigned a mentor. Thus far, most of these mentors have been traditional classroom teachers who are either given extra compensation or freed up for a class period to help online students.

Dearborn Virtual Academy, an MVS member located outside Detroit (and, despite its name, a traditional bricks-and-mortar school), allows only 30 students in a computer lab at any given time and maintains a 1:15 mentor-student ratio by stationing two mentors in each lab. These mentors spend the first week of class ensuring that students know how to navigate their e-mail and course Web sites and then remain available throughout the course for questions or problem solving.

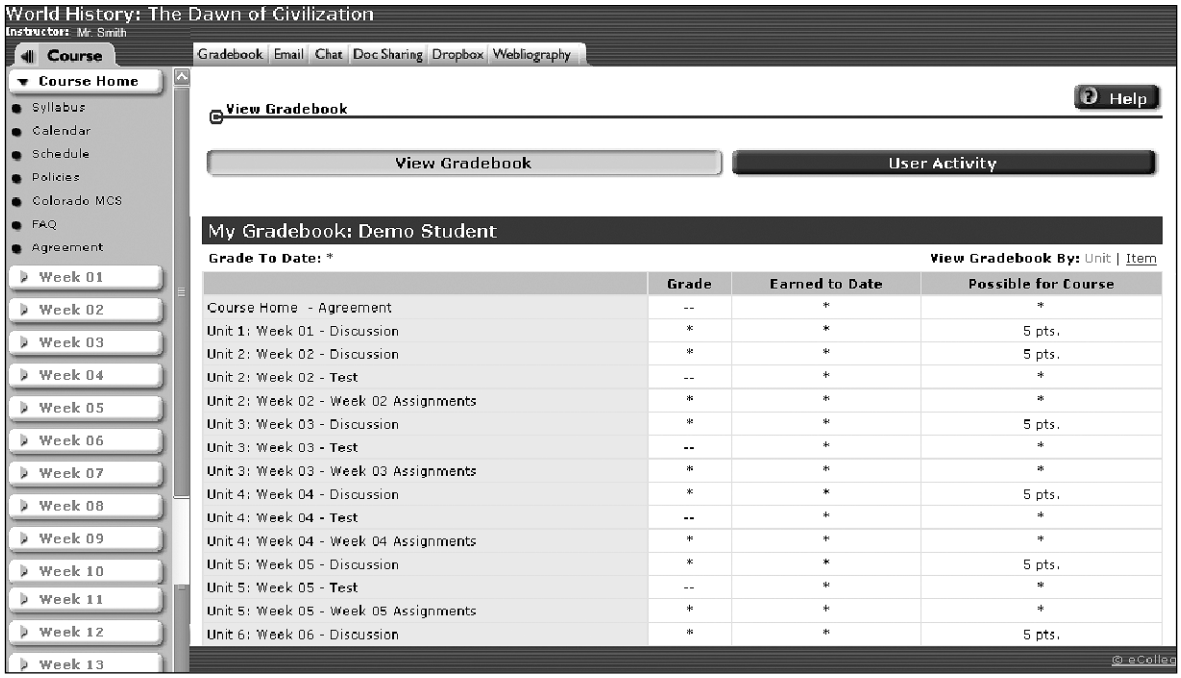
Both site coordinator and mentor positions have been established to help ensure that online students can be successful in their courses. People in these positions must be ready to deal with a wide array of issues, from content questions, which they may or may not be able to answer, to issues of cheating, to a student's failure to actively participate once enrolled because of technical difficulties. In short, these individuals must be prepared to offer student support in many areas.

Many site coordinators also are responsible for providing quarterly and midterm progress reports to parents. For example, COL's director of student services works with districts and schools to provide parents with access to their student's online grade book (see fig. 5 on p. 44). From here, parents can see when assignments have been turned in and, eventually, see the grade for each assignment. Although it doesn't show on this screen shot, the site also has a feature that allows parents to see how much time their students are spending on each assignment.

To specifically support students who are participating in advanced course work, FLVS restructured its offerings so one instructor is qualified to teach the same course at multiple levels. Under this system, for example, an AP English language instructor also can teach an English III honors course. This allows students who might start out in an AP course, but, subsequently, find themselves unable to keep up, to switch to the English III honors course, and continue with an instructor who is familiar with their work, so as to not waste the time or energy they had put into the first course.

School and program leaders interviewed for this guide emphasize the need to provide student support extending beyond that offered by any good online instructor. FLVS, for example, requires regular parent and instructor interaction so parents can monitor student participation and performance, while IOAPA requires on-campus student support from a coordinator. Whatever its specific components, a support system for online learners should touch both environments in which students work: the traditional and the virtual.

Figure 5. Screen Shot of Online Grade Book Used by Colorado Online Learning



Note: Items with double dashes are online exams or quizzes that a student has not yet submitted. Once an exam or quiz has been submitted, a dash turns to an asterisk so the instructor knows to grade it.

Evaluating Student Support

Parents are an important source of information about how well recruitment and support services are received in the field. The FLVS annual survey asks parents about their own level of education, why their children enrolled in online courses, and if they perceive FLVS student services to be helpful. In 2005–06, nearly 5,000 parents completed surveys. Among other things, parents were asked if they thought FLVS guidance counselors were helpful in placing students in the appropriate online courses and acclimating both parents and students to the FLVS environment; of responding parents, 87 percent said their child's guidance counselor was able to address their issues. The other 13 percent responded that services were not very helpful because they were not aware of all the services a guidance counselor provided, such as being able to report student progress and monitoring results.[40] FLVS responded by reviewing the current parent information dissemination process and finding areas where information could be improved, elaborated upon, or disseminated more frequently.

Monitoring Student Progress and Evaluating Provider Success

While each of the previous sections of this guide has included examples of evaluation of that specific component of program operations,

both providers and districts need to look beyond process to outcomes.* The bottom line in measuring course success is how well students do. While partnering districts and schools must track the progress and success of their individual students, online providers will want to track how the broad range of their online students are performing as an indicator of their own success. All data can then be used to make program improvements.

VHS, for example, tracks and reports several measures of student success, each of which tells an important part of the story. For AP courses, in particular, VHS tracks student enrollment, course completion rates, the number of students taking AP exams, and the how they do on those exams. As part of schools' partnership agreements with VHS, their students are required to share their AP exam scores. Site coordinators receive student scores from the College Board and submit a copy to VHS. To protect students' privacy, when VHS leaders receive score reports, they record them using a random tracking number, and the copies are destroyed.

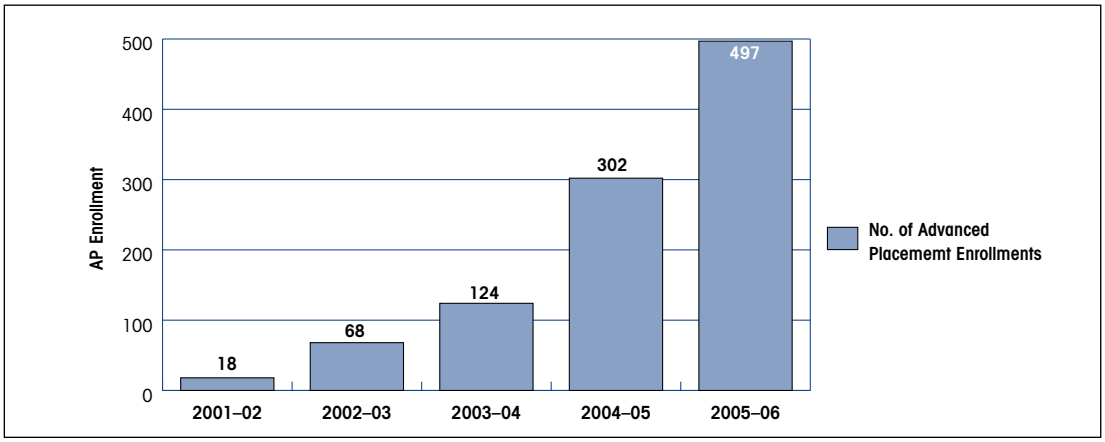
Figure 6 on page 46 shows a dramatic increase in the number of AP course enrollments through VHS over the past five years. As of 2007, VHS reported an 85 percent completion rate for AP courses.[41] Figure 7 on page 47 shows how students are doing on AP exams. As enrollment has increased, so has the number of exams taken—up to 350 in 2005–06. The bottom part of each bar shows the number of exams taken but not passed; the top part shows the number of exams taken and passed. The percentage of students passing the exam has fluctuated some over the years, starting quite high when only a few students took the exams and dropping as more students enrolled,[42] but has always exceeded the average pass rate for the U.S. as a whole, which was 59 percent in each of the last two years.[43]

Of course, the goal is for all students to master the material well enough to take and pass the exam. But, as noted earlier, some research shows that taking an AP course is valuable even if a student does not take or does not pass the exam.[44] And there are likely to be some transition steps as more students are encouraged to take AP courses. Some students may be more comfortable taking the course without having to take the exam, so allowing this option may encourage them to try taking an AP course. Likewise, students may not do well on a first exam, but may do better on any subsequent exams they take. By tracking all four measures, a program and a district or school will gain valuable data that shed light on areas to investigate in an effort to improve outcomes over time.

The providers profiled in this guide also track a variety of other outcome measures. COL contracts with a private consulting firm, the Public Good, to conduct an especially comprehensive evaluation of program outcomes that includes measures of enrollment, course completion, grades, and student perceptions of what they have learned. Course completion rates at COL have increased each of the last four years, from 78 percent in 2003 to 92 percent in 2006.[45] When students themselves reflected on what they had learned, many mentioned 21st century skills that were enhanced by the online learning

* An upcoming guide in this Innovations in Education series will focus exclusively on how to evaluate online learning programs.

Figure 6. Virtual High School's Advanced Placement Enrollment, 2001–02 to 2005–06 School Years



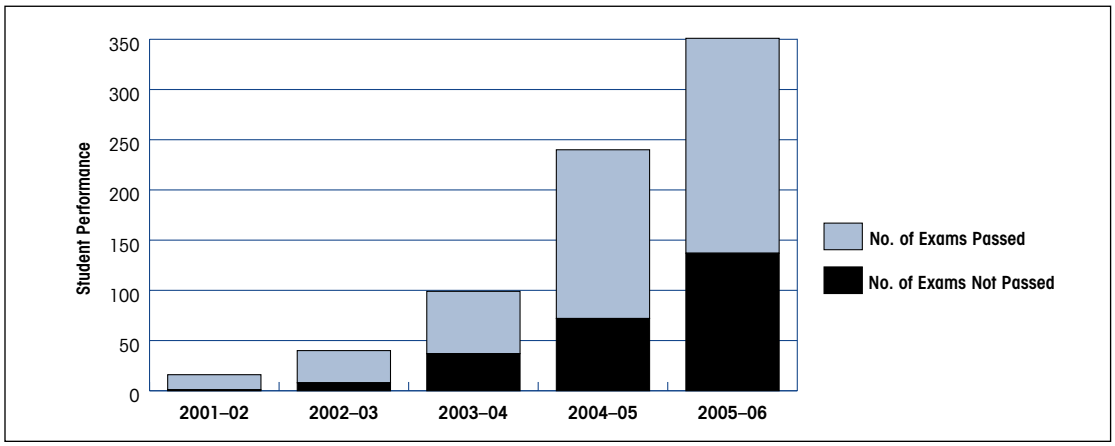
Source: Liz Pape of Virtual High School, 2007, "VHS Quality Benchmark Indicators," PowerPoint presentation, slide 14.

process; that is, skills recognized as important for success as citizens and workers in the 21st century, like self-direction and communication. For example, one student reported, "I think that students should take online courses because it teaches them how to be independent in their studies." Another said, "This course taught me more self-discipline in one semester than in all of my other years combined."[46]

COL also looks closely at the characteristics of the students being served. Charged with serving schools with high academic needs and those with high poverty rates, COL can report that more than half the districts enrolling students in 2006 can be considered high-need, high-poverty districts, up from an average of 34 percent in the preceding years. This makes the high course completion rate of 92 percent all the more impressive.

In addition to collecting quantitative data (e.g., enrollment numbers, passing rates), these providers and their partner schools or districts also find it useful to collect qualitative data to help them improve their program. Their evaluations include satisfaction surveys of key stakeholders, including parents and students, as well as administrators, teachers, and site coordinators. A number of providers ask students to complete end-of-course evaluations (see fig. 8 on p. 48 for an example). CTY's survey asks about quality of instruction, the student's level of interest in course content prior to and after taking the course, ease of technology use, and the student's academic plans. COL also asks those who withdraw from an online course to complete an "early exit" survey, via e-mail. All providers indicated an interest in learning more from students who dropped an online course prior to completion about their reasons for doing so. VHS and FLVS also use their surveys to probe about unmet course needs. FLVS increased the number of electives it offers based on requests delivered through its customer satisfaction survey.

Figure 7. Virtual High School Students' Performance on Advanced Placement Examinations, 2001–02 to 2005–06 School Years



Source: Liz Pape of Virtual High School, 2007, "VHS Quality Benchmark Indicators," PowerPoint presentation, slide 13.

Note: The Virtual High School pass rate on AP examinations has always exceeded the average pass rate for the U.S. as a whole, which was 59 percent in each of the last two years.

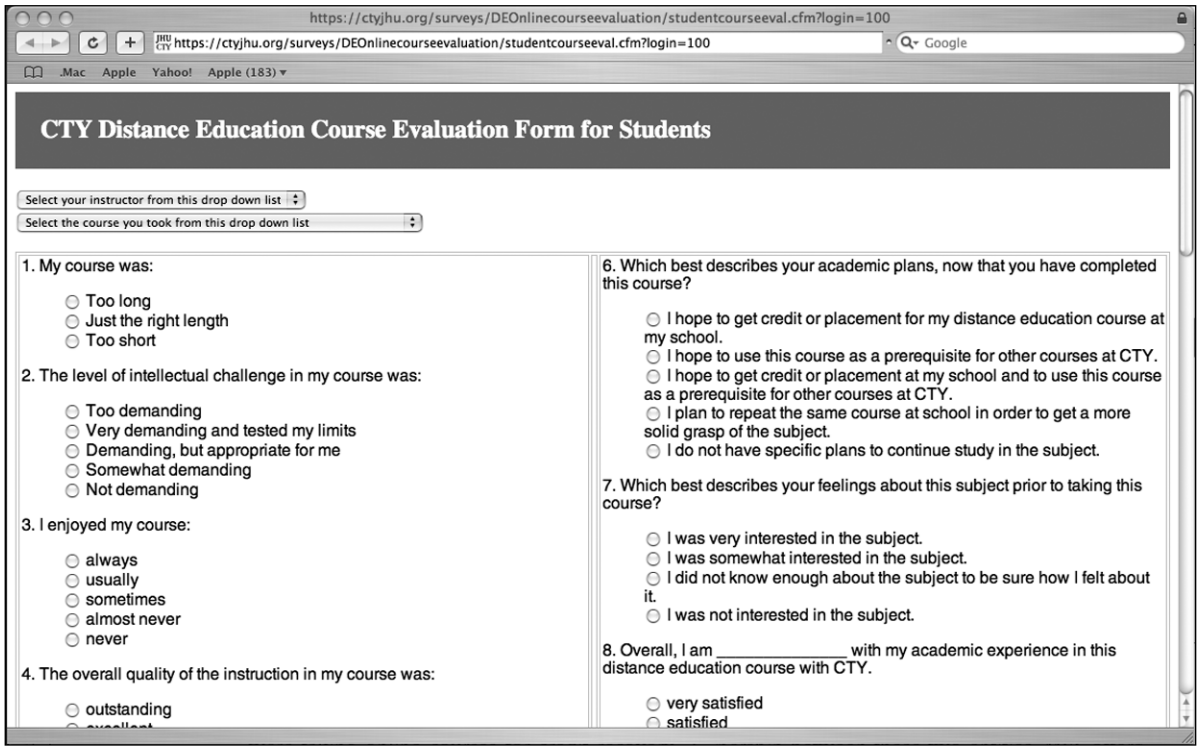
Creating Funding Options and Scaling Up

To increase participation and continue to help schools build their capacity, programs strive to offer affordable funding options. Most districts pay for students' participation in an online program as they would for any other service, by including the cost in the annual budget and creating a purchase order and account with the program in order to facilitate payment. In VHS's cooperative model, each school pays an annual membership fee, but costs are offset through each school committing teacher time to course design and delivery. Other programs offer "bulk rates" for student seats in courses.

At CTY, parents or schools pay student tuition; however, the program offers scholarships and financial aid to qualified students. In 2005–06, COL obtained grant funding and successfully advocated for legislation to provide reimbursement to small school districts based on each district's online enrollment for the 2006–07 school year. In 2007, instead of each district receiving funding through reimbursement, the legislature allocated $500,000 directly to COL. COL, in turn, intends to use the funding to reduce district costs for per-course enrollment. COL will continue to work with the legislature for future funding. In Florida, the legislature agreed to include FLVS in the state's per-pupil funding model, with funding based largely on successful course completions. Like many state university systems, both FLVS and MVS also have created out-of-state pricing to help sustain in-state program offerings.

MVS, CTY, VHS, and FLVS are all implementing strategic development plans to accommodate increasing district and student demand for on-

Figure 8. CTY's Online End-of-Course Evaluation Form (Excerpt)



line learning. One strategy is to acquire more advanced courses from third-party providers. VHS's cooperative model calls for recruiting more member schools, each of which, in turn, provides a teacher to develop and instruct the first section of an additional online course. Worth noting is that when the Michigan legislature made participation in at least one online course a high school graduation requirement, it also provided MVS with additional funding for course development to accommodate anticipated demand growth. When FLVS found that district requests for "seats" in key online courses was exceeding its ability to deliver, it adopted a franchise model through which a district uses its own teachers to deliver FLVS courses. Currently, eight Florida districts have a FLVS franchise. Courses, themselves, are at the heart of Web-based learning; but as has been shown throughout this section, courses are just one element of a successful online learning program.

Scaling up is about more than just adding new titles or creating additional sections to popular courses. It also includes the very practical step of increasing support services, including, for example, the hours that computer labs are open and monitored. When it first started a distance learning program, one MVS school kept its computer lab open and staffed three hours a day, catering mainly to students who were taking online courses for credit-recovery purposes. But as word got out about the availability of online courses and demand grew for AP and elective courses, the school found itself needing to ex-

pand the hours of its computer lab to four, then five, and, most recently, six hours a day.

Chiefly, though, scaling up is about making sure there is adequate support for all involved—for students, for those individuals who offer direct support to these online learners (e.g., mentors, site coordinators), and for online instructors. As such, scaling up must be tied to continuous improvement efforts by both site and provider and is most effective when carried out in partnership between these two entities. MVS offers one example of what form this effort can take. Approximately 350 Michigan schools currently have students enrolled in MVS courses, and each year MVS hosts a conference for some 40 schools with the highest percentages of students taking online courses. At this gathering, schools are encouraged to reflect collaboratively on the online learning program they offer to their students in partnership with MVS. They discuss what aspects appear to have been most engaging and to have resulted in the greatest success for their students. They discuss and evaluate services they receive from MVS, such as mentor orientation and training. And, finally, they discuss any obstacles or problems that they or their students have encountered during the year. Schools and MVS alike emerge from the conference with new insights, solutions, and ideas about how to strengthen their programs as they reach out to serve ever greater numbers of students.

Conclusion

This part of the guide has presented some cross-cutting elements from strong online course providers and the districts and schools with which they have partnered. Like Gary Pascal from the introduction of this guide (see p. 1), a school or district can begin the process of implementing a successful online program for delivering advanced course work by conducting a needs assessment to identify students' needs for and interests in advanced course work. Once the decision has been made to move forward, the Suggested Practices for the School-Provider Partnership table at the beginning of this section may be used to help guide the site coordinator through next steps for implementing a successful program. The checklist in Appendix A (Online Learning Program Implementation Checklist for District or School) is also a useful resource that can be adapted to address district and school needs.

Clear roles and responsibilities should be established at the school and district levels. Many online course providers recommend identifying a site coordinator who will serve as the link between site and provider and as the primary contact for students and their parents. To help ensure a positive learning experience for students, a district or school should look for a course provider with a well-developed student support system in place. If the provider is new, it should, minimally, have plans for evaluating its support system and making improvements as it grows toward being a mature system. Partnering schools will want to help their course provider evaluate its student support program by supplying any requested data or completing surveys, for example. Both the districts and schools and the providers featured in this guide agree that the more support a student receives, both online and on-site, the more likely it is that the student will succeed with advanced online courses. It is the responsibility of the site to

choose a provider with a high-quality course-development process and with courses that are delivered through high-quality instruction. Choosing providers that monitor and evaluate online teachers will ultimately benefit students. After entering into a positive partnership with a provider, the site coordinator can begin recruiting, counseling, and enrolling students.

A successful site-provider partnership and the online program it supports must be sustained through iterative evaluation and continuous improvement. Schools and districts can contribute to the evaluation efforts by participating in client-satisfaction surveys and, if necessary, supplying the providers with student achievement and demographic data. By establishing a strong partnership and networking with other sites and programs, districts, schools, and providers are furthering the online learning field and creating an environment that gives today's students more opportunities to succeed in high school and beyond.

Part III

Profiles of Highlighted Online Course Providers

Colorado Online Learning

Florida Virtual School

Iowa Online Advanced Placement Academy

Johns Hopkins University—Center for Talented Youth

Michigan Virtual High School

Virtual High School

Colorado Online Learning

Lakewood, Colo.

School Profile: Selected Variables [a]	
Year Initiated	1998
Initiator	Consortium of 14 districts
Types of Courses Offered	AP[b] Honors Dual-credit Core Electives
Number of Courses Currently Offered	80
Total Student Enrollments Since Inception	6,832

[a] These data are reported by the school and are for the school year 2006–07.

[b] Advanced Placement

Colorado Online Learning (COL) began in 1998 as the 14-district Colorado Online School Consortium, supported by a three-year federal Technology Literacy Challenge Fund grant administered through the Colorado Department of Education (CDE).* In 2002, the consortium became a nonprofit company, took its new name, and received additional federal funding. From an initial enrollment of 60 students, COL enrollment grew to a high of 800-plus students per semester in 2004–05 before dropping to 600–700 students per semester in 2005–06, when student tuition rose at the end of grant funding. COL students represent more than 80 (45 percent) of the state's 178 school districts. Approximately three-quarters of the students live in rural Colorado, with the remainder residing in urban and suburban communities, primarily in the Denver area. According to student surveys, students' primary motivation for participating is to gain access to courses not available at their home schools.

Because COL's predecessor organization was initiated at a time when both the U.S. and Colorado departments of education were calling for higher achievement in math and science, its staff first developed and piloted several core mathematics and science classes. But starting in 1999, they began recruiting licensed teachers from partner school districts to develop online courses. In 2002, when COL received a second round of federal funding, it created a quality assurance program to oversee the development of new courses and to review current offerings. That second grant required COL to hire an external evaluator to appraise it on a quarterly and annual basis throughout the three-year grant period.

COL's board of directors oversees course development and hiring of instructors, but members have no contact with partner schools or districts. COL staff oversee day-to-day implementation, including enrollment, for example. In addition to its executive director, COL has four other staff members: a director of instruction, who manages issues related to course development and instruction; a student services director, who oversees school membership and student enrollment; a technology services director, handling all technology-related issues; and a director of mathematics instruction. This last position was created because COL has so many mathematics courses that it needs a full-time individual to manage the mathematics curriculum and support teachers.

Student Recruitment and Enrollment

COL staff recruit districts, schools, and students by attending education conferences and talk-

* See page 55 for more on funding.

ing to school leaders. The student services director notes that COL's origins as a district-based, rather than a state-based, organization may have impeded quicker growth because COL is not centrally funded or otherwise supported by the CDE. Nevertheless, to maintain open communication between the two organizations, COL consistently invites CDE staff to attend its board meetings.

The most common reasons for students to enroll in COL courses include: to take a course not offered by their school, to take a course that is otherwise unavailable to them because of a scheduling conflict, and to progress toward high school graduation while home for medical or disciplinary reasons. Each partner school's or district's site coordinator—the school or district staff member assigned overall responsibility for program implementation at the site**—is responsible for discussing COL options with students and parents, enrolling students, and monitoring student progress. To help both the site coordinator and a student understand the student's possible strengths and challenges in undertaking online learning, COL provides a student survey that the coordinator can administer as a means of initiating a discussion about learning styles and environments. Some of COL's partner schools require participating students and their parents to sign a contract attesting to their knowledge of how online learning works and of obligations for course completion.

Course Offerings

A COL survey of Colorado school districts in 2000 yielded varied suggestions for courses. COL chose to create rigorous courses for advanced students, a decision that enhances postsecondary options for students in rural and high-poverty school districts. In addition to advanced and supplementary enrichment classes, it now also provides remedial classes. COL created several mathematics review classes because high school teachers lamented that too many students had not mastered basic arithmetic and algebra skills by the time they enrolled in higher-level mathematics courses. The nonprofit provider owns 95 percent of the 80-plus classes it offers to students. COL also enables students to earn college credit by taking dual-enrollment classes that are co-offered by COL and its higher education partners (i.e., University of Colorado at Denver, Jones International University, and Adams State College) and for which students can earn both high school and university or college credit. For an additional $150 per class (beyond the standard $200 per-course enrollment fee), students can elect the dual-enrollment option, by which they complete additional assignments designated by a partnering institution of higher education and earn both high school credit and college or university credit at the same time.

Under COL's Quality Assurance Program, certified Colorado teachers can propose a course by completing the *Pre-Development Course Outline,* using a template available online, and submitting it to COL's director of instruction, who selects courses for development. Whether reviewing proposals for new courses or the provider's current offerings, the director of instruction evaluates such elements as instructional design, pedagogical style, software requirements, and opportunities for student collaboration. At the same time, external subject matter experts examine course content. Once a course proposal is approved, the teacher develops the course according to guidelines created by COL. Teachers log their time spent on course development and revision, submit it to the director of instruction for approval, and receive $30 an hour for the work. The director of instruction evaluates courses and instructors, submitting written evaluations to the COL executive director (who is a

** See figure 1 on page 18 for a list of COL site coordinator responsibilities.

licensed principal), who summarizes the evaluations for COL's board of directors.

Instruction, Mentoring, and Support

Currently, COL employs 35 part-time teachers, and any Colorado-certified teacher may apply to teach an online course. Similar to the survey offered to interested students is COL's survey for prospective teachers, which evaluates their readiness to teach an online course. In their application, teachers must designate which course they want to teach, assess their technical skills, and write a short essay explaining their interest in online teaching. COL pays an instructor $165 for every student who passes the instructor's course, with the funding coming from course tuition and, when available, grants.

Although COL aims to become a fully digital provider, some classes still use traditional textbooks. COL instructors submit their book and material requirements to the student services director, who buys and distributes textbooks to schools; to students, who return the books to COL after completing the course; or to both. Schools and students are responsible for auxiliary materials, such as calculators and art supplies.

After students' initial enrollment, schools have 25 days in which to withdraw students without a fee; COL then invoices the districts for all remaining students. Teachers monitor student participation and generally are required to give a status report to the school site coordinator at 10 and 25 days; they are asked to report more frequently for inactive students. The site coordinator tracks student progress through this direct instructor feedback and by checking the student's online "grade book," which includes assignments, the time spent working on the task, and any grades. A parent seeking information about his or her child's work can speak with the site coordinator or enter the student's portal using the student's name and a password provided by COL. Final grades are reported by COL in percentages, which the school then translates to a letter grade based on its own grading scale. (In some schools, for example, an 89 percent might be considered an A, while at others, it might be considered a B.)

COL's courses are hosted by the eCollege platform (i.e., a Web-based framework for running software, such as Microsoft Word). COL pays eCollege a hosting fee to maintain the Web site for its courses, and COL's technology services director works closely with eCollege to ensure that the Web site functions well for all participants. Students and teachers experiencing technical difficulties address their questions to the eCollege help desk rather than to COL. Schools whose students enroll in COL courses are obligated to provide appropriate Web access, which, in some cases, requires schools to reset their network firewalls.[47]

Funding

During its first six years, COL was funded in part by two consecutive three-year federal grants: the Technology Literacy Challenge Fund (TLCF) grant in 1998 and an Enhancing Education Through Technology (EETT) grant in 2002. (The EETT program created under the *No Child Left Behind Act of 2001* consolidated the TLCF and Technology Innovation Challenge Grant programs into a single state-formula*** grant program to support the integration of educational technology into classrooms to improve teaching and learning.) During the six years of this grant funding, COL schools paid $200 per course enrollment unless they had

*** Formula grants are allocations of federal money to states or their subdivisions in accordance with a distribution formula prescribed by law or administrative regulation for activities of a continuing nature not confined to a specific project.

a high proportion of students whose families lived below the poverty line, in which case the school paid only $100 per enrollment. When the second grant ended in 2005, COL raised the price of enrollment to $300 per student regardless of school demographics. Because more than half of the schools participating in COL are high-poverty, high-need schools, enrollments dropped after the price increase.

Earlier state legislation (House Bill 06-1008) allowed districts with fewer than 3,000 students, as well as eligible charter schools, to be reimbursed on a formula basis for the cost of courses successfully completed by their students. The formula was based on district enrollment for grades 6–12. However, that bill called for reimbursement funding only for the 2006–07 school year. During the summer of 2007, COL sought and secured $500,000 from the state for the 2007–08 school year. Instead of being used to reimburse eligible school districts on a per-student completion basis, the funds will be used to reduce the price of enrollment from $300 to $200 per course.

Florida Virtual School

Orlando, Fla.

School Profile: Selected Variables [a]	
Year Initiated	1997
Initiator	District partnership with state grant funding
Types of Courses Offered	AP[b] Honors Core Electives
Number of Courses Currently Offered	80
Total Student Enrollments Since Inception	200,000

[a] These data are reported by the school and are for the school year 2006–07.

[b] Advanced Placement

Started in 1997 by two Florida school districts, the Florida Virtual School (FLVS) has since grown from five classes serving 77 students to more than 85 classes serving over 31,000 students in Florida and other states. In addition, individual districts can operate a franchise of FLVS whereby the district purchases a license to deliver FLVS online courses taught by its own teachers.

Two years after FLVS opened, the state appropriated money for the provider through a line-item addition to the state budget. FLVS students earn a half credit for each semester of a course, and since 2003, Florida has provided per-pupil funding based on students' completion of half-credit (or one-semester) courses. FLVS expects to consistently grow by expanding its enrollment in existing classes, marketing a new middle school program, increasing the number of electives it offers in addition to core courses and a variety of advanced courses, and continuing to promote its courses in other states.

Through FLVS, students may take either half-credit courses, which run for 18 weeks (i.e., one semester), or full-credit courses, which run for 36 weeks (i.e., two semesters). Courses range from middle school reading support and classes that prepare students for the SAT examination to honors academic and AP classes. In 2006–07, there were 2,348 enrollments, almost half by minority students, in 11 AP classes. All courses are accessible online around-the-clock and Web-based instruction often is supplemented by textbooks, CDs, and videos. Utilizing a modular course design in which content is organized in sequential sections, similar to units, FLVS requires students and instructors to participate in either synchronous (i.e., when people are communicating in real time) or asynchronous (i.e., when people are not online at the same time) discussions at the completion of each course section. The FLVS teachers make themselves available to students from 8 a.m. to 8 p.m. daily.

Student Recruitment and Enrollment

Florida legislation requires that FLVS grant priority to students from schools that are rural, low-performing, high minority, or all of the above; students who need only one course to graduate; and students who are home- or hospital-bound. Priority placement does not eliminate

course prerequisites. It simply allows priority students first access to age- and grade-appropriate classes.

Four regionally based external school counselors visit districts and schools to inform people about FLVS and promote participation in the learning opportunities it offers. Conversations with schools and districts have confirmed that they are well informed about FLVS, but FLVS leaders recognize that parents and students tend to be less aware of it. As a result, FLVS's director of Florida services has created a diversity initiative to increase communication among staff, parents, and students. In 2006–07, the external school counselors began working with community- and faith-based organizations to acquaint more community members with FLVS and encourage more minority students to take part. FLVS also runs ads in school newspapers and hopes to broadcast public service announcements in the future. In May 2007, FLVS ran a 15-second advertisement in three Florida movie theaters, targeting specifics areas of the state where they were seeking to increase enrollment.

FLVS has three internal guidance counselors who support students, parents, and teachers throughout the enrollment process. These counselors also assist students who are schooled at home, and they make presentations about FLVS at parent education conferences. FLVS furnishes schools' own guidance counselors with handouts, questionnaires, and access to students' FLVS records in order to help them explore FLVS options with students.

Seventy-two percent of FLVS students come from public schools; 21 percent are homeschooled; and 7 percent attend private schools. Students who want to take a class enroll online. FLVS's student-data management system, the Virtual Student Administrator (VSA), maintains up-to-date statewide demographic and school performance information so that once students input their school and district, the VSA can automatically rank their placement priority based on the state's criteria, described earlier on page 57. School counselors and parents must log in to the system and approve the student's online course choice. FLVS seeks to expand access to advanced classes and, thus, any student can take honors or AP classes with counselor approval. Once enrolled in a class, a student has 28 days to withdraw without penalty.

Course Offerings

At FLVS, curriculum and instruction teams design and refine courses using the most contemporary online instruction tools. When necessary, the teams consult with outside technical experts. Each year, FLVS revises one-third of its courses so that every course is retooled at least once every three years.

FLVS's history of offering AP courses began in 1997–98 with AP computer science. In 2000–01, it added more AP classes at the behest of teachers across districts who had identified strong students interested in AP courses that their schools could not provide. In addition to teaching 11 AP courses, FLVS also offers free College Board AP exam reviews in 10 subjects to any Florida student who intends to take an AP exam, regardless of where he or she took the AP course. FLVS's AP students take the AP exams in their district, and FLVS reimburses the district for the cost of the exams.

All core academic courses, such as English and mathematics, are offered as either regular or honors classes. Students who elect the honors option complete additional work and are graded on a more rigorous scale. FLVS recently restructured teacher assignments so that instructors can

teach both the AP and regular or honors versions of a course; in this way, students who find the AP course too challenging can drop back to honors and keep the same teacher.

Since receiving additional funding from the state starting three years ago, FLVS has added both regular and accelerated middle school classes. Students in eighth and 10th grades also may utilize FLVS's online preparation tool for Florida's statewide assessment, the Florida Comprehensive Assessment Test (FCAT). Finally, students seeking to improve their SAT scores may enroll in a one-semester SAT prep class through FLVS.

Instruction, Mentoring, and Support

FLVS boasts a 95 percent teacher retention rate among its 425 full-time and 200 part-time state-certified instructors. Organizationally, two directors of instruction oversee three learning community leaders. In turn, each learning community leader oversees up to six instructional leaders, and each instructional leader oversees 50 to 60 teachers from different content areas in randomly assigned teams called "schoolhouses." The intent of having multiple disciplines represented in a schoolhouse is to bring together teachers who can share different perspectives about instruction so as to help others in the group think "outside of the box" when considering how to improve their own practice.

FLVS trains new instructors in online protocol, customer service expectations, and interactive learning tools. A highly formalized mentor program extends FLVS support for new teachers throughout their first year. FLVS uses more than 90 board-certified teachers to assist with new hires and six full-time FLVS instructors who provide formal mentor support. Mentors teach a half-course load and work with new instructors. All teachers have an annual enrollment completion goal that is based on the type of courses they are teaching; they are paid only for students who complete their courses, and they receive a bonus if they exceed their annual enrollment completion goal. A full-time reading coach supports instructors who are working with students who have reading challenges.

FLVS course instructors make welcome phone calls to introduce themselves to students and parents and to review the course pace and required materials. After the class starts, instructors are required to contact students and parents once a month to report on student progress. Interaction between the instructor and school staff is more variable; its type and frequency depend on student needs, such as the need for English language support.

FLVS staffs a dedicated technology team that manages hardware, handles software licensing (all software and online tools that FLVS uses are licensed from companies and the licenses must be kept up to date), and makes sure the server is operating so students and teachers can access the online courses. To provide help desk support for students and faculty, FLVS subcontracts with Innovations Port (iPort). It partners with other vendors to provide students with multimedia experiences, such as video streaming.

Funding

FLVS receives per-pupil funding from the state legislature based mostly on successful completion rates. In 2006, the Florida legislature recognized that FLVS had to use budgeted resources to provide educational services to students who did not finish course work, regardless of the reason for noncompletion or the length of time students spent in a course. This use of resources took away funding from students who finished courses. To compensate FLVS for students who

did not complete their online courses, the state legislature modified the funding formula to add 11.4 percent to the unweighted full-time equivalent student count. If a public school student takes an FLVS class during school time, the funding for that class period goes to FLVS; if a public school student takes an FLVS class at home, the public school does not lose any funding. The per-pupil funding model has enabled FLVS to expand easily according to demand without charging in-state students directly. Out-of-state students pay a fee to enroll in FLVS classes.

Iowa Online Advanced Placement Academy

Iowa City, Iowa

School Profile: Selected Variables [a]	
Year Initiated	2001
Initiator	Belin-Blank Center
Types of Courses Offered	AP[b]
Number of Courses Currently Offered	11
Total Student Enrollments Since Inception	5,616

[a] These data are reported by the school and are for the school year 2006–07.

[b] Advanced Placement

In 2000, only a third (141) of Iowa's 426 high schools offered Advanced Placement (AP) courses, with approximately 3,800 of the state's 80,000 11th- and 12th-graders enrolled in the courses.[48] Viewing access to AP courses as an equity issue, the Connie Belin & Jacqueline N. Blank International Center for Gifted Education and Talented Development created the Iowa Online Advanced Placement Academy (IOAPA) in 2001, with the intent of making advanced course work accessible to broader numbers of students. While there is still room for progress, as of 2006, more than half of Iowa high schools (227 out of 423) were offering AP courses. Of the approximately 6,600 juniors and seniors enrolled in these courses, many took multiple AP classes. Among them, they took some 9,800 AP exams and achieved a pass rate (i.e., percentage of exams on which students scored a 3 or above, with 5 being the highest) of nearly 70 percent—higher than the national passing rate of just under 60 percent that year.[49]

In its first year, IOAPA introduced 10 AP courses that were licensed from Apex Learning, a third-party course provider that licenses AP courses nationwide. In 2002, two additional courses were added and taught through the Iowa Communication Network (ICN), a state agency that operates a two-way video system, the original medium for distance learning in Iowa. ICN has continued to be used for teaching AP music theory, while Apex Learning's offerings had expanded from 10 courses to 13 by 2006. After signing on its first cohort of students for the fall of 2001, IOAPA experienced high attrition rates (57 percent) during its first semester. Staff attributed the rates, in part, to students having unreliable access to computers and unpredictable Internet access and, in part, to students not being adequately prepared for the challenging level of AP courses. Those particular problems have largely been resolved, as participating schools have tried to ensure adequate technology for their online students and as an academic culture supportive of AP has slowly evolved at host schools. By 2003, the attrition rate had plummeted to 4 percent. Since then, however, the rate has risen again slightly (to 10 percent), primarily due to (1) students dropping out of online language courses for which they had not been adequately prepared by previous instruction and (2) the addition of new partner schools that have resulted in an increasing number of student enrollments.

All IOAPA classes follow a traditional semester schedule, with a semester running approximately 18 weeks. Four classes (i.e., macroeconomics, microeconomics, psychology, and U.S.

government and politics) are one-semester courses offered twice a year, while all other classes are two-semester courses and can only be started in the fall. Any Iowa student can enroll in the Web-based AP exam reviews that IOAPA licenses from Apex Learning.

In addition to offering online AP courses and review sessions through the IOAPA program, the Belin-Blank Center also publishes the Iowa AP Index, which lists the top 50 schools in the state based on the ratio of AP exams taken by students in the school to graduating seniors (see http://iowaapindex.org), honors the top 25 schools from the index at an annual ceremony, and continues to train teachers to teach AP classes.

Student Recruitment and Enrollment

To promote IOAPA, its director makes presentations at an annual state conference for gifted-and-talented programs and, also, networks with school-based gifted and talented coordinators and district administrators. In addition, IOAPA staff present their program at ICN conferences (where they also collect contact information) and conduct promotional events via the ICN network. In some areas, recruiting students for IOAPA requires demonstrating to school administrators and parents the relative value of an AP course compared to other options.

Students only can enroll in IOAPA classes after their school has registered with IOAPA. The registration process requires school leaders to certify that they can provide adequate technology, a site monitor, and a mentor for students. In addition, schools are required to register with the College Board and agree to administer the AP exams. Schools determine which students may take IOAPA classes, and students must pass the first semester to continue in a yearlong class.

IOAPA recommends that the school offer the online AP classes during the school day because the courses should be considered part of a school's program of studies rather than viewed as an extra, outside-of-school activity. IOAPA believes that by enabling students to pursue these courses during the regular educational day, a school sends the message that it supports this level of curriculum. Students enrolled in the ICN-facilitated classes must be available for synchronous instructor-student time, while students enrolled in IOAPA's online courses can schedule the class at any time during the day. Enrolled students meet with their site mentor at the beginning of the year to check for conflicts (e.g., assignments due while the school is on break) and then work with the course instructor to resolve any problems.

Site coordinators and school counselors help identify students who could benefit from IOAPA's courses. Pretests are available to help guide decisions for several of the mathematics and science classes. While IOAPA recommends using the same withdrawal policies for in-school and online AP classes, schools have the freedom to determine their own online-course-withdrawal policy, which often ends up being the same as their general withdrawal policy. IOAPA online instructors also can recommend to the site coordinator that a student be dropped from the course, something most likely to happen if a student has not actively participated in the course or has failed to complete assignments on time. IOAPA staff also follow student progress and log-ins very closely. The final decision to drop a student is made by the site coordinator after extensive conversation with IOAPA staff. Every school assigns a teacher-of-record to an IOAPA class; this teacher receives a recommended grade from the IOAPA instructor and then assigns the final course grade based on the school's own grading scale.

Course Offerings

When determining which courses to offer, IOAPA evaluates past course enrollment, attrition rates, and exam scores. The social studies classes have proven to be the most popular thus far; at the other end of the spectrum, a combination of high attrition and low enrollment in language classes led IOAPA to drop AP French and AP Spanish. Because the College Board has traditionally required online science classes to have a lab component taught by qualified staff at a bricks-and-mortar school (see *Course Materials for Online Learning* on p. 29), IOAPA has been attentive to the availability of highly qualified mentors to monitor lab activities at its partner sites. IOAPA does not currently offer AP biology, for example, because schools have been unable to ensure the availability of highly qualified staff to supervise the labs. However, it does offer AP chemistry and AP physics B, for which schools can ensure that labs are supervised by highly qualified site mentors.

Instruction, Mentoring, and Support

All IOAPA instructors, whether working with Apex Learning or ICN, are state-licensed. Apex Learning trains its teachers in the AP curriculum, as well as in teaching techniques and online learning strategies. School site coordinators distribute required course materials to students. Site mentors meet with all students face-to-face, proctor exams, review student progress, and communicate with parents. For students who are studying online (versus taking a course using ICN's video technology), mentors also ensure that they log on regularly and complete assignments in a timely fashion. Technology requirements for the online courses include reliable broadband Internet access, a personal e-mail account, word processing software, access to a printer and fax machine, and the capacity to download free software, such as Adobe Acrobat.

Although IOAPA currently receives federal grant funding, program staff recognize that continued grant funding is never guaranteed. Thus, they strive to increase the number of schools offering on-site AP classes by encouraging teachers to participate in the week-long Belin-Blank Center's Advanced Placement Teacher Training Institute (APTTI) for teachers interested in developing and teaching AP courses in a standard classroom. IOAPA also provides APTTI "vertical team strategies" to show middle and high school English and social studies teachers how to align their courses to better prepare their students for success in AP and other advanced course work. In the past five years, IOAPA has trained over 500 teachers through these programs. Teachers must apply to attend the institute (for which 50 scholarships are available), with priority given to teachers from schools that offer IOAPA classes and serve disadvantaged students.

Funding

A $1.6 million Technology Innovation Challenge grant from the Iowa Department of Education funded the creation and initial operation of IOAPA. Though the grant originally covered one year, it was subsequently expanded to cover a three-year period, 2001–04. In 2002, the U.S. Department of Education's Advanced Placement Incentive Program (API Program) provided funding to the Belin-Blank Center to maintain IOAPA's online AP support for rural schools and students. This funding is being used for course tuition and materials ($380 per student per course), mentor stipends ($200 per teacher per semester), and teacher training.

Johns Hopkins University—Center for Talented Youth

Baltimore, Md.

School Profile: Selected Variables [a]	
Year Initiated	1994
Initiator	JHU-CTY
Types of Courses Offered	AP[b] Accelerated[c] Honors
Number of Courses Currently Offered	60
Total Student Enrollments Since Inception	53,000

[a] These data are reported by the school and are for the school year 2006–07.

[b] Advanced Placement

[c] An accelerated course compresses the content that normally would be covered in a longer course into a shorter timeframe.

Focusing on the acceleration and enrichment of student learning, the nonprofit Johns Hopkins University—Center for Talented Youth (CTY) works with high-ability students in elementary, middle, and high school, both domestically and internationally. In addition to offering challenging supplemental course work to youths who have been identified as talented through testing or other means, CTY also conducts an annual talent search to further identify talented youths, organizes community outreach events to engage low-income students and families, and researches academic attainment among high-ability students.

CTY offers courses to students in grades K–12 and has enrollments that exceed 8,000 per year by students in more than 50 countries. To qualify for CTY distance learning and summer programs, students must score high for their grade level on academic aptitude exams; for example, seventh-grade students who take the SAT or American College Test (ACT) and score relatively high for their grade level would qualify for CTY admission consideration. When identifying students as gifted, CTY especially values reasoning abilities and reading skills. CTY is accredited for grades 5 through 12 by the Commission on Secondary Schools of the Middle States Association of Colleges and Schools, which eases the credit-transfer process.

Online courses are available year-round in either individually paced or session-based formats, the latter meaning that a course has a start and end date with established due dates for assignments. Courses in mathematics, computer science, and science (below the AP level) use the flexible, individually paced format, which allows students to progress at a pace that matches their abilities, as well as their schedules and time constraints. Students can start the course at any time and enroll in it for three, six, or nine months. A student who completes the course more quickly than the time purchased can enroll in a new course at no additional charge. A student who does not complete the course in the time purchased can buy additional time. While these individually paced courses are usually asynchronous, meaning that students and instructor are not required to be online at the same time, communicating in real time, the instructors hold interactive whiteboard sessions during which they review material and students can collaborate with one another.

CTY's session-based courses are offered in the fall, spring, and summer, and their length varies by course. Writing, language arts, foreign language courses, and AP courses (except AP

calculus) are offered in sessions. Because students enrolled in these courses participate on the same general schedule, they tend to have more interaction with each other, such as in workshops and online group activities, than do students in individually paced courses.

Student Recruitment and Enrollment

CTY recruitment, in verbal, written, and Web-based forms, emphasizes enrichment and acceleration opportunities for students who are highly able academically. Using direct mail, targeted recruiting in urban areas, and communication through school districts and community- and faith-based organizations, staff seek out gifted students. In most major urban areas, a CTY regional staff member coordinates outreach and gives presentations in schools and in other settings to parents. In 1998, CTY received funding from Goldman Sachs to create a minority outreach program that has since helped boost minority enrollment from 3 to 14 percent.

Qualified students can enroll in CTY courses using either a paper or an online application. Once a student signs up for a class, CTY mails required course materials within 12 days. Most courses are graded, though writing students receive a detailed evaluation of their progress in lieu of grades. (Writing students may request a grade, if required for credit or course placement decisions at their high school or college.) For students seeking credit or placement in their schools, CTY provides detailed course descriptions, including scope and sequence, along with grades and interim reports to school officials.

Course Offerings

CTY currently offers courses, some of which are AP, in mathematics, science, computer science, language arts, writing, and Chinese, and more courses are under development. In addition to accelerated and honors mathematics classes that extend from pre-primary math through multivariable calculus, CTY offers a variety of mathematics enrichment courses, such as cryptography and a math-oriented introduction to astronomy. Science courses are offered at the middle school, high school, and AP levels. CTY's language arts and writing courses focus on essay writing, critical reading, advanced topics in writing, and language rules. Chinese language courses are offered for grades 2 and up, using interactive multimedia software and online classrooms with video and audio capacities. Finally, CTY also has developed a six-disc problem-solving software package called Descartes' Cove Math Series that can be purchased by students for individual learning or licensed by schools for math enrichment. Students advance through a cove, or bay, by completing adventures (i.e., solving complex word problems) that align with the National Council of Teachers of Mathematics' standards for grades 6–8.

AP classes are a recent addition to the CTY course catalog, and in the 2005–06 school year, 200 students took advantage of this option. Except for calculus, the provider's eight AP courses can be taken either over an intensive summer session or as one-year courses starting in the fall. Students can, but are not required to, take the AP exam. As of this writing, all CTY AP courses have been approved by the College Board.

Instruction, Mentoring, and Support

CTY instructors are teachers with content and online expertise who have at least a bachelor's degree and may or may not be K–12 certified teachers. Most instructors hold advanced degrees, including a Ph.D. Many of the AP course instructors are college professors who teach

part time for CTY, which enhances the intellectual vitality and college-like experience of these courses. Some writing instructors are published authors, also teaching part time for CTY. Instructional supervisors each support and monitor about 10 teachers.

When designing courses, CTY first determines the learning goals of a course and then builds the course accordingly. Frequent assessments along with regular online interaction with faculty are critical components of CTY courses. Writing courses build in peer review to complement instructor feedback. CTY instructors interact with students through e-mail, telephone, online classes, progress reports, and an interactive Web-based whiteboard. Students receive both mid-term progress reports and end-of-course evaluations from their teachers.

All students require a computer and Internet access to take CTY courses, and some courses, Chinese, for example, require broadband access and a microphone. Technical requirements are listed on the CTY Web site under each course. Instructors use a variety of course materials, typically incorporating multimedia presentations, Web-based content, text materials, audio materials, and interactive exercises. Many courses also offer students a discussion board to facilitate interaction between geographically dispersed students. Students obtain technical support through their instructors and through CTY's technical support team.

Funding

CTY courses are funded by student and school tuition, along with various grants and donations for course development and scholarships. Many schools pay the tuition for CTY distance courses in order to expand options for their highly able students, and CTY accepts purchase orders. In other cases, parents provide all or part of the tuition. Need-based financial aid also is available for families.

Michigan Virtual High School

Lansing, Mich.

School Profile: Selected Variables [a]	
Year Initiated	2000
Initiator	Michigan Virtual University
Types of Courses Offered	AP[b] Core Electives
Number of Courses Currently Offered	110
Total Student Enrollments Since Inception	26,700

[a] These data are reported by the school and are for the school year 2006–07.

[b] Advanced Placement

In 2000, a transition from the Michigan Virtual Automotive College, a vocational training environment dedicated to the needs of the Big Three automakers, to the Michigan Virtual University (MVU) yielded what is now the Michigan Virtual High School (MVS). Then, in 2006, six years after MVU received an $18 million grant to build an online high school, Michigan became the first state to require all students to complete an online class in order to graduate from high school. Starting with the class of 2011, Michigan high school students will need to have had an online learning experience in order to graduate from high school.

MVU serves as the nonprofit parent company for three distinct educational enterprises: MVS, Michigan LearnPort (an online professional development program for teachers), and Michigan Career Services (a career exploration resource for students). Driven by a desire to increase access and equity, MVS offers students across the state opportunities to complete courses in core areas, take AP classes, learn languages, and undertake electives otherwise unavailable.

In 2005–06, about 7,200 students from 350 Michigan schools enrolled in MVS classes. MVS classes are asynchronous (i.e., when people are not online at the same time) and follow one of four models: Flex, Semester-Paced, AP, or Student-Direct. Under the Flex plan, students elect a start date anytime from early-September to mid-October and have up to three months to finish the course. While there are no set deadlines, course instructors offer guidelines to pace students. Semester-Paced courses follow the academic calendar, and students must complete assignments by and take exams on scheduled dates. AP classes adhere to the goals and curricula articulated by the College Board program. Student-Direct courses allow students to enroll in the class at any time during the year and give students three instructional months to complete the class offered by a third-party course provider, PLATO Learning. These self-paced courses do not have course instructors but are facilitated by the local school, and moving through them is contingent on completing each module with an end-of-module test score of 80 percent or better.

Student-Direct classes are the least expensive of MVS's offerings, at $129 per enrollment, while AP classes are the most expensive at $350 per enrollment. Both Flex and Semester-Paced courses cost $275 per enrollment. MVS allows Michigan schools to purchase AP, Flex, and Semester-Paced classes in bulk. For 10 enrollments, the AP classes cost $3,250 and the Flex and

Semester-Paced classes cost $2,500. There is no bulk rate for Student-Direct classes.

In addition to partnering with PLATO Learning to offer the Student-Direct classes, MVS works with the Confucius Institute at Michigan State University (CI-MSU) to teach Mandarin Chinese classes; partners with Apex Learning, the Florida Virtual School (FLVS), and the Monterey Institute for Technology and Education, who all serve as third-party course providers of AP classes; licenses AP exam reviews in 11 subjects from FLVS and Apex Learning; and collaborates with another third-party provider, Bridges Transitions, to supply a review course for a portion of the Michigan Merit Examination and the American College Test (ACT). Any student planning to take an AP test may enroll in the AP exam review class at no cost as a part of the AP course tuition; non-MVS students pay an enrollment fee of $25. Likewise, any student can enroll in the Michigan Merit Exam/ACT preparation course, which prepares students for both exams; the Michigan legislature has appropriated funds to make the class free to Michigan students in 2006–07.

Student Recruitment and Enrollment

MVS markets itself to schools in person, through the mail, and on its Web site. The provider hosts annual regional conferences for the schools most active with MVS, at which it introduces new policies and requests feedback about the prior year in order to improve its offerings. Marketing staff attend 12–15 education conferences each year to promote MVS opportunities, while regionally based part-time "ambassadors" visit and call schools in their assigned area. Ambassadors also serve as liaisons between school site coordinators and MVS. Ultimately, the school site coordinators, usually school guidance counselors, oversee the online education at their school and work with students to determine how MVS can best serve their academic goals.

Eight MVS staff members are responsible for marketing, enrollment, and business management. Of this group, two serve as enrollment specialists who can assist school counselors or site coordinators with the online enrollment process. MVS provides schools with an Online Learner Orientation Tool, an informal online quiz that helps students evaluate whether they are ready for online learning. The quiz also can be used as a conversation starter between students and guidance counselors. Once a student is enrolled, a school has 25 calendar days to decide whether the student should remain in the class. If the student or school decides that dropping the class is the best move, schools can retain the enrollment for future use.

Course Offerings

MVS offers courses in all of Michigan's required credit areas for high school graduation. MVS develops the courses in collaboration with Michigan teachers and ensures that courses meet both the Michigan Curriculum Framework and national standards (e.g., National Assessment of Educational Progress [NAEP] curriculum frameworks, American Council on the Teaching of Foreign Language standards). Enrollment in foreign language classes has accelerated recently, and MVS has begun marketing its Chinese class nationwide to generate additional enrollments.

At its inception, MVS offered AP courses to high schools at no cost, but schools were generally skeptical of online learning. As awareness of the benefits of AP classes in general and comfort with online learning grew, so, too, did enrollment in these classes. In 2002, a highly discounted subscription model was introduced,

and AP enrollment reached its highest level. However, subsequent reductions in state funding for MVS made it necessary for MVS, in turn, to reduce the amount of subsidy it was providing to member schools, effectively raising school enrollment costs. Although enrollment has since declined slightly, MVS hopes to expand its AP catalog, ideally with courses developed by Michigan teachers.

Instruction, Mentoring, and Support

MVS has a pool of 180 teachers, all certified in Michigan, who have completed its four-week online instructor-training program and, thus, are eligible to teach online classes. Last year, 70 to 80 teachers from the pool contracted with MVS as part-time instructors. The MVS instructional manager oversees department chairs (who mentor new teachers and help ensure consistency between courses within a content area) and all of the MVS instructors. Instructors who help develop courses and teach the first section of a course become informal "lead teachers" who help subsequent instructors understand the course design and course delivery.

Each student has a school-based mentor (a certified teacher) who supports the student, monitors progress, and facilitates communication between the student and the online instructor. The MVS contract stipulates that its instructors will respond to student and site coordinator e-mails within 24 hours, grade assignments within 48 hours, and grade tests within 72 hours. The MVS database tracks student activity, logs the amount of time students spend on tasks, and retains progress reports, all of which can be accessed by the student, teacher, parent, and mentor.

The vice president of operations leads the MVS digital services group, which supports the necessary technology. MVS-developed courses are delivered through the Blackboard platform, a platform being the Web-based framework for running software and other Web-based tools. MVS maintains a help desk Monday through Friday from 7 a.m. to 7 p.m. and on Sunday from 5 p.m. to 9 p.m.

Funding

An initial $15 million grant from the state of Michigan in 2000 funded the creation of MVS, along with its operations and services for two years. During this time MVS provided all online products and services to Michigan's K–12 community at no cost. Since then, legislative appropriations for MVS, which have ranged from $750,000–$2,000,000 annually, have covered part of MVS's operating costs. In 2002, MVS introduced a tiered-pricing model, in which subscriptions were based on the size of a district's student population. Under this subscription model, schools still profited from highly subsidized pricing for courses and services. But in 2004–05, in response to a decline in state funding, MVS had to reduce its subsidization of courses and instructional services, moving to a per-enrollment pricing model. With state funding reduced, MVS found it necessary to make this change in order to cover its own costs, chiefly, teacher compensation, courses licensing, and software licensing. Although MVS still provides a highly competitive per-enrollment tuition for schools, the changed pricing structure has negatively and disproportionately affected small schools, which had utilized the more greatly subsidized pricing of earlier years to enroll significant numbers of students.

Virtual High School

Maynard, Mass.

School Profile: Selected Variables [a]	
Year Initiated	1996
Initiator	Concord Consortium, Hudson Public Schools
Types of Courses Offered	AP[b] IB[c] Honors Core Electives
Number of Courses Currently Offered	216
Total Student Enrollments Since Inception	40,028

[a] These data are reported by the school and are for the school year 2006–07.

[b] Advanced Placement

[c] International Baccalaureate

The Virtual High School (VHS) is a nonprofit membership organization made up of schools across the nation—and in other countries—that want to offer their students more rigorous course work. VHS was established in late 1996 by the Concord Consortium, a nonprofit Massachusetts-based education research and development organization whose mission is "to stimulate large-scale, technology-based improvements in teaching and learning."[50] The consortium's initial work had included delivering online professional development for teachers, using a brokering method in which schools shared teacher costs and expertise. Its intent in creating VHS was to adapt the same model to offer online courses to high school students.

Initially, VHS member schools had to guarantee that at least one of their teachers would participate in VHS's year-long training, the Teachers Learning Conference, during which the teacher would develop and deliver an online course. Participating schools also agreed to assign someone to serve as a site coordinator, who receives online training in how to support students taking VHS courses. If schools also freed up their site coordinator for one period a day to monitor students, they received a $9,000 annual stipend.

By its fourth year, VHS recruitment efforts had yielded 87 member schools. At this stage, however, the organization recognized that its ability to meet the needs of schools would be limited by its initial membership requirements, specifically, the length of its training program and the need for each new member to create a new course. That is, the length of the training meant that a school that learned about VHS midyear, for example, could not become a member until the following year. Moreover, by requiring that each new member commit a teacher to developing and teaching a new course and not having anyone else prepared to teach that course, VHS would have unwieldy numbers of students in its most popular courses while, at the same time, ending up with more unique courses than its membership needed.

VHS changed its membership requirements, adding a six-month training—NetCourse Instructional Methodologies—that prepares new online instructors to teach an additional section of an existing course rather than to develop a new course themselves. This allows VHS to offer more sections of courses in high demand and, therefore, limit the number of students in each section. Smaller classes help ensure that students have more opportunity for interaction with their instructor and classmates. The year-

long training is still available for teachers who are developing a course, but VHS plans to add no more than 10 courses a year. At least partly as a result of this change, VHS's membership jumped to 232 schools in the organization's fifth year (a 167 percent increase from just the previous year).

VHS offers membership options for individual schools, districts, and consortia of schools. Generally, each school commits one teacher to teach a VHS course (which that teacher may or may not have developed) and, in return, receives 25 student seats or enrollments per semester. Member schools with fewer than 600 students receive 15 seats per semester, and a consortium of schools can receive bulk discounts.

Student Recruitment and Enrollment

To attract new members, VHS conducts an ongoing marketing effort about the benefits of online learning. Much of the marketing work focuses on communicating about benefits that administrators might not have considered, such as students' gaining global citizenship as they interact online not just with students from other states, but also from other countries. VHS also exhibits at local and national conferences where participants can examine its extensive course catalog. Its global services team markets directly to district and school decision-makers (e.g., superintendents, principals, curriculum coordinators, department heads, teachers), describing the benefits of online courses for students, including AP exam participation and pass rates.

Once a school chooses to participate (whether on its own, through its district, or as part of a consortium), school-site staff begin recruiting students. VHS provides recruitment tools, including marketing materials and a 15-question online survey that enables students to reflect on their aptitude for online learning. Once they sign up, students complete a five-hour student orientation course. Site coordinators use the results from each student's survey and orientation course to discuss learning styles, time management, and technology skills with the student.

Course Offerings

VHS currently offers 185 unique courses (many with multiple sections) and intends to add approximately 10 new ones each year. VHS teachers design courses based on the National Education Association's guidelines for high-quality online courses. All new courses are reviewed by two full-time curriculum coordinators and are mapped to the state standards from those states with member schools.

In 2003, VHS received a grant from the U.S. Department of Education's Advanced Placement Incentive Program, to develop an Online Advanced Placement Academy (Online AP Academy). The grant enabled 52 low-income high schools and their feeder middle schools to create, deliver, and receive online AP, pre-AP, and middle school enrichment courses. The Online AP Academy's 12 pre-AP courses, developed by vertical teams of middle and high school teachers, prepare students to successfully master the concepts in AP courses and teach study skills to strengthen students' academic habits. During the 2004–06 school years, VHS collaborated with the International Baccalaureate (IB) foundation in a pilot effort to deliver an IB economics course online. It has since extended and expanded the pilot and is offering two IB courses online: economics and information technology in a global society.

Instruction, Mentoring, and Support

VHS instructors must be certified in the disciplines in which they teach and successfully complete one of VHS's trainings, during which they are evaluated on their readiness to deliver online instruction. Once they start teaching online courses, they receive ongoing professional development and support through VHS's online Community of Virtual Educators (COVE), a Web site at which instructors can seek help from VHS's professional developers, commonly referred to as lifeguards.

All VHS courses are delivered via asynchronous (i.e., when people are not online at the same time) teacher-facilitated "classrooms," with class size limited to 25 students per instructor. VHS provides a three-week, no-penalty withdrawal period. At one time, instructors did not post students' grades until the course had been underway for three weeks. But teachers and students found that if a student fell three weeks behind on his or her assignments, it was nearly impossible for the student to catch up and he or she would not succeed in the course. Instructors now start posting grades immediately after the course begins, and site coordinators at member schools track the grades regularly so they can plan student support.

Funding

From the beginning, VHS has aimed to be self-supporting. It began with a $7.8 million Technology Innovation Challenge grant from the U.S. Department of Education, which fully funded its first five years. But 18 months prior to the end of the grant, VHS advised members that when the grant ended schools would be charged a membership fee; it also told them what the fee would be so they could budget accordingly. Of the 232 members at that time, 160 stayed on and another 23 members were added that same fall, so the net loss was only 49 schools. VHS took a similarly farsighted approach with its Online AP Academy. At the beginning of the second year of the U.S. Department of Education's three-year Advanced Placement Incentive Program grant, participating Online AP Academy schools paid one-third of their costs, with two-thirds funded by the grant. During the third year of membership, schools covered half the costs, and in 2006–07, they began paying the entire cost. According to VHS's chief executive officer, this kind of transition plan enables schools to participate without having to come up with funding immediately, giving them the opportunity to understand the value of the program and time to budget accordingly.

Membership fees range from $1,500 to $8,500 per year, depending on the size of the school, its online enrollment numbers, and whether someone from the school is teaching an online course. To help schools find the necessary funding to participate, VHS provides information about grant writing, including a free How to Fund Your VHS Membership Webinar.

APPENDIX A

Online Learning Program Implementation Checklist for District or School

Online Learning Program Implementation Checklist

Considerations	Person Responsible	Date Completed	Comments
Conduct a needs survey for online learning with students and parents			
Identify online learning provider that can meet identified needs			
Ensure courses are aligned to local, state, and national standards			
Establish procedures for course payment			
Ensure school can meet the technical requirements for students to access online courses			
Identify and train site coordinators and site-based mentors			
Recruit students, draft and publish contract for online course enrollment and participation			
Prepare student and parent orientation materials and provide orientation meetings			

Note: From *Local School System Planning, Implementation, and Evaluation*, by Maryland Virtual Learning Opportunities, (n.d.), Baltimore, Md.: Author. Adapted with permission.

APPENDIX B

Research Methodology

The research approach underlying this guide is a combination of case study methodology and benchmarking of best practices. Used in businesses worldwide as they seek to continuously improve their operations, benchmarking has more recently been applied to education for identifying promising practices. Benchmarking is a structured, efficient process that targets key operations and identifies promising practices in relationship to traditional practice, previous practice at the selected sites (lessons learned), and local outcome data. The methodology is further explained in a background document,[51] which lays out the justification for identifying promising practices based on four sources of rigor in the approach:

- Theory and research base;
- Expert review;
- Site evidence of effectiveness; and
- Systematic field research and cross-site analysis.

The steps of the research process were defining a study scope, seeking input from experts to refine the scope and inform site selection criteria, screening potential sites, selecting sites to study, conducting site visits, collecting and analyzing data to write case reports, and writing a user-friendly guide.

Site Selection Process

Guided by a review of the literature, recommendations from an advisory group, and review of advanced course offerings and student participation in online courses, researchers initially considered 35 online course providers managed by districts, states, universities, or education consortia. Based on a requirement that providers be able to provide at least two years of student performance data, that initial list was reduced to 27 providers.

Seven online course providers were selected from this larger list as case study sites,* based on the compiled information and criteria ratings in a screening matrix. (See next section for more on criteria.) The type of entity creating or operating the course provider (e.g., a state, a consortium of schools or districts, a university), geographic location, student demographic variation, and a range of promising practices were all considered in this final site selection.

Site Selection Criteria

Programs were selected for case study based on a set of features identified during the review of literature and prioritized by the advisory group

* One of the selected programs declined to participate in the study.

as key issues for consideration. Programs were evaluated based on their ability to provide evidence that they:

- Assess for student readiness to take online courses, especially advanced course work online;
- Provide a ladder for student success, with frequent and varied supports for students including teacher interaction and on-site mentors;
- Design and deliver highly engaging courses using online media;
- Serve a diverse student population;
- Offer opportunities and support, such as supplemental funding, to encourage disadvantaged students to participate; and
- Track program cost data.

Study Framework and Data Collection

A conceptual framework was developed to guide the study of the selected programs. The framework was derived from the research literature on students taking advanced course work, on online learning, and on organizational or program effectiveness. The major categories in the framework were program goals and performance evaluation, funding models and sources, program promotion and student recruitment, course creation and delivery, and staffing. The framework focused on practices that are implemented to increase opportunities for students to participate in advanced course work and to support their efforts in completing courses successfully. During the case studies, researchers also heard from program, district, and school leaders and from parents and students about what they view as key factors for student success when studying advanced content online.

To gather information for this guide, researchers conducted interviews both on-site and by telephone. Each one-day site visit was supplemented by telephone interviews with school site coordinators, principals, central office administrators, parents, and students. All interviews followed a protocol based on the study framework and adapted to each role group. That is, separate but overlapping sets of questions were developed for program leaders, school administrators, parents, students, and others. All of the interviews were recorded, with key interviews later transcribed for more detailed analysis.

Documentation from each program served as additional sources of information. Collected during the site visits, these documents included such items as course descriptions, recruiting and marketing materials, online screen shots, instructor training materials, school site facilitator guides, parent-student agreements for participation, and program evaluations.

Analysis and Reporting

A case report was written about each program and reviewed by program leaders for accuracy. Drawing from these case reports, program documentation, and interview transcripts, the project team identified common themes that contributed to success across the programs and districts and schools that participated in one of the programs. This cross-site analysis built on both the research literature, as reflected in the study scope, and on emerging patterns in the data.

This descriptive research process suggests promising practices—ways to do things that others have found helpful, that is, lessons they have learned—and offers practical how-to guidance. This is not the kind of experimental research that can yield valid causal claims about what works. Readers should judge for themselves the merits of these practices, based on their understanding of why they should work, how they fit the local context, and what happens when they actually try them. Also, readers should understand that these descriptions do not constitute an endorsement of specific practices or products.

Using the Guide

Ultimately, readers of this guide will need to select, adapt, and implement practices that meet their individual needs and contexts. District, school, and online learning program leaders coming together in learning communities may continue to study the issues identified in this guide, using the ideas and practices from these sites as a springboard for their own action research. In this way, a pool of promising practices will grow, and educators can support each other in implementation and learning.

APPENDIX C

Resources

Advanced Placement Incentive Program

The U.S. Department of Education's Advanced Placement Incentive Program (API Program) supports activities to increase the participation of low-income students in both pre-AP and AP courses and tests. Its grants support the development, enhancement, or expansion of AP courses, including pre-AP courses aligned with AP courses in mathematics, science, English, and other subject areas.

http://www.ed.gov/programs/apincent/index.html

College Board

The College Board is a nonprofit membership association composed of more than 5,000 schools, colleges, universities, and other education organizations. The College Board supports students with major programs, such as Advanced Placement, which includes both courses and related examinations. Its Web site provides AP standards, exam locations, information about laboratory science standards, as well as other valuable information and tools for districts considering an AP program.

http://www.collegeboard.com

International Baccalaureate

Since 1968, the International Baccalaureate (IB), a nonprofit education foundation, has offered an internationally oriented curriculum to schools worldwide. Its two-year diploma program, for students ages 16 to 19, has begun piloting several online courses. Its Web site explains the curriculum and other aspects of the program.

http://www.ibo.org

Keeping Pace with K–12 Online Learning: A Review of State-Level Policy and Practice

This 146-page report, published by Evergreen Consulting in 2007, provides an in-depth analysis of state, district, and full-time online programs across the nation. Issues include students served, funding, curriculum, policy, and quality assurance for both teachers and courses. The report is available at no cost by downloading it from the Web site of the North American Council for Online Learning.

http://www.nacol.org

Maryland Virtual Learning Opportunities' *Local School System Planning, Implementation, and Evaluation Guide*

The Maryland Virtual Learning Opportunities' *Local School System Planning, Implementation, and Evaluation Guide* is a useful resource when considering program implementation. Planning considerations are divided into a three-part checklist of planning, implementation, and evaluation. Additionally, suggested roles and responsibilities are provided for both district- and school-based personnel. The guide can be found online at the following URL, using the link on the left-hand side for the "Planning, Implementation, and Evaluation Guide."

http://mdk12online.org/schools/schoolshome.htm

National School Boards Association's Technology Leadership Network

The National School Boards Association's (NSBA) Technology Leadership Network is a district membership program that offers professional development opportunities regarding the most current information about education technology, including how districts can measure the impact of technology on student achievement.

http://www.nsba.org/site/page_micro.asp?TRACKID=&CID=82&DID=214

North American Council for Online Learning

The North American Council for Online Learning (NACOL), established in 2003, is an international K–12 nonprofit organization that strives to enhance K–12 online learning through the sharing of knowledge, advocacy, and research. NACOL research areas include course content, course management systems, teacher professional development, virtual education program administration, and state and federal public policy. The NACOL Online Learning Clearinghouse provides a listing of online-learning-related laws and programs in the U.S. NACOL organizes multiple conferences each year, such as the Virtual School Symposium and the Regional Professional Development Symposium. Additionally, the organization sponsors a monthly Webinar series about online learning issues; a current schedule is on its Web site. *Top 10 Myths About Virtual Schools,* provided by NACOL, dispels common misperceptions about online learning and courses and how virtual schools fit in the contemporary education landscape.

http://www.nacol.org

http://www.nacol.org/resources

Southern Regional Education Board/ AT&T Foundation State Virtual Schools Alliance

Southern Regional Education Board/AT&T Foundation State Virtual Schools Alliance was created in 2005 to assist SREB's 16 member states to increase middle- and high-school students' access to rigorous academic courses through state-supported virtual schools. Through AT&T Foundation grant funding, the alliance facilitates collaboration and information and resource sharing between states in order to create and improve state virtual schools. Valuable resources, including but not limited to the *SREB Standards for Quality Online Courses* and *Standards for Quality Online Teaching*, are available, respectively, at the following Web sites:

http://www.sreb.org/programs/edtech/pubs/2006Pubs/06T05_Standards_quality_online_courses.pdf

http://www.sreb.org/programs/EdTech/pubs/PDF/06T02_Standards_Online_Teaching.pdf

Notes

[1] National Commission on Excellence in Education, *A Nation at Risk: The Imperative for Educational Reform* (Washington, D.C.: U.S. Department of Education, 1983). Available at http://www.ed.gov/pubs/NatAtRisk/index.html. Last accessed on Jan. 6, 2007.

[2] New Commission on the Skills of the American Workforce, *Tough Choices or Tough Times: The Report of the New Commission on the Skills of the American Workforce* (Washington, D.C.: National Center on Education and the Economy, 2006).

[3] See, for example, Stanley O. Ikenberry. Higher Education in a Changing World: An Opportunity for Global Collaboration. Plenary keynote presented at IAU Durban Conference: Universities as Gateway to the Future, Aug. 22–25, 2000, in Durban, South Africa. Available at http://www.unesco.org/iau/conferences/durban/rtf/confdurban11.rtf. Last accessed on Nov. 1, 2006.

[4] Alan Greenspan. Future of the Social Security Program and Economics of Retirement. Testimony before the U.S. Senate, Special Committee on Aging, Mar. 15, 2005. Available at http://www.federalreserve.gov/BoardDocs/Testimony/2005/20050315/default.htm. Last accessed on Sept. 21, 2006.

[5] National Association of Manufacturers, *The Looming Workforce Crisis: Preparing American Workers for 21st Century Competition* (Washington, D.C.: National Association of Manufacturers, 2005). Available at http://www.nam.org/s_nam/bin.asp?CID=37&DID=235064&DOC=FILE.PDF. Last accessed on Oct. 16, 2006.

[6] New Commission on the Skills of the American Workforce, *Tough Choices or Tough Times, Executive Summary* (Washington, D.C.: National Center on Education and the Economy, 2006), 6–8.

[7] U.S. Department of State, *National Security Language Initiative Fact Sheet* (Washington, D.C.: U.S. Department of State, Jan. 5, 2006). Available at http://www.state.gov/r/pa/prs/ps/2006/58733.htm. Last accessed on Aug. 9, 2007.

[8] U.S. Department of Education, *Answering the Challenge of a Changing World: Strengthening Education for the 21st Century* (Washington, D.C.: U.S. Department of Education, 2006), 21. Available at http://www.ed.gov/about/inits/ed/competitiveness/strengthening/strengthening.pdf. Last accessed on Aug. 9, 2007.

[9] See, for example, Jay P. Greene and Marcus A. Winters, "Public High School Graduation and College-Readiness Rates: 1991–2002," education working paper, Manhattan Institute for Policy Research, New York, 2005.

[10] See, for example, "Diplomas Count: An Essential Guide to Graduation Policy and Rates," *Education Week 25*, no. 41S (June 22, 2006): 3.

[11] Margaret Spellings, prepared remarks for "National Summit on America's Silent Epidemic" (Washington, D.C., May 9, 2007). Available at http://www.ed.gov/news/pressreleases/2007/05/05092007.html. Last accessed on Sept. 12, 2007.

[12] U.S. Department of Education, *A Test of Leadership: Charting the Future of U.S. Higher Education* (Washington, D.C.: U.S. Department of Education, 2006), vi. http://www.ed.gov/about/bdscomm/list/hiedfuture/reports/pre-pub-report.pdf. Last accessed on Sept. 12, 2007.

[13] U.S. Department of Education, National Center for Education Statistics, *The Condition of Education* (Supplemental Notes, Note 6: NAEP, NELS, and HS&B Transcript Studies). Available at http://nces.ed.gov/programs/coe/2003/supnotes/n06.asp. Last accessed on June 19, 2007.

[14] The value of advanced courses is supported by research showing, for example, that students who scored 3 or higher (out of a maximum of 5) on 25 AP math and science exams and were exempted from the introductory courses in these subjects earned the same or higher grades in the second-level courses as students who took the introductory courses. (Rick Morgan and Len Ramist, *Advanced Placement Students in College: An Investigation of Course Grades at 21 Colleges* [Princeton, N.J.: Educational Testing Service, 1998]). There is also some evidence that participation in rigorous AP course work increases students' likelihood of success in

postsecondary work even when they do not pass the AP exam. (Tom Luce and Lee Thompson, *Do What Works: How Proven Practices Can Improve America's Public Schools* [Dallas, Texas: Ascent Education Press, 2005], 141–143.)

[15] U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, Special Analysis 2007: High School Coursetaking.* Available at http://nces.ed.gov/programs/coe/2007/analysis/index.asp. Last accessed on June 20, 2007.

[16] Ibid.

[17] Ibid.

[18] U.S. Department of Education, National Center for Education Statistics, *The Condition of Education, Context of Elementary and Secondary Education: Coursetaking and Standards,* "Availability of Advanced Courses in High Schools." Available at http://nces.ed.gov/programs/coe/2005/section4/indicator25.asp. Last accessed on June 20, 2007.

[19] Anthony G. Picciano and Jeff Seaman, *K–12 Online Learning: A Survey of U.S. School District Administrators* (Needham, Mass.: The Sloan Consortium, 2007), 7–9.

[20] William R. Thomas, director, Educational Technology, Southern Regional Education Board, e-mail to author, April 11, 2007.

[21] Eugenio J. Gonzales, Kathleen M. O'Connor, and Julie A. Miles, *How Well Do Advanced Placement Students Perform on the TIMSS Advanced Mathematics and Physics Tests?* (Boston: The International Study Center, Boston College, 2001).

[22] U.S. Department of Education, National Center for Education Statistics, *Distance Education Courses for Public Elementary and Secondary School Students: 2002–03.* Available at http://nces.ed.gov/surveys/frss/publications/2005010. Last accessed on Oct. 12, 2007.

[23] Tiffany Waits, J. Carl Setzer, and Laurie Lewis, *Dual Credit and Exam-Based Courses in U.S. Public High Schools: 2002–03,* NCES 2005–009 (Washington, D.C.: U.S. Department of Education, National Center for Education Statistics, 2005). Available at http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2005009. Last accessed on Nov. 9, 2007.

[24] John Watson and Jennifer Ryan, *Keeping Pace with K–12 Online Learning: A Review of State-Level Policy and Practice* (Vienna, Va.: North American Council for Online Learning, 2006). Available at http://www.nacol.org/docs/Keeping%20Pace%20with%20K-12%20Online%20Learning%202006.pdf. Last accessed on June 19, 2007.

[25] Learning Point Associates, *Virtual High School Program Evaluation, 2004–06* (Orlando, Fla.: Virtual High School, 2007), 35. Available online only with registration at http://www.govhs.org/Content/WhyVHS-Publications. Last accessed on Sept. 17, 2007.

[26] Center for Evaluation and Assessment, College of Education, University of Iowa, executive summary for *IOAPA Site Coordinators' Survey Report* (internal document, Iowa Online Advanced Placement Academy, 2006).

[27] NEA's *Guide to Online High School Courses,* issued June 2002, and developed in partnership with Virtual High School, the American Association of School Administrators, the CNA Corporation, IBM Corporation, National Association of State Boards of Education, National School Boards Association, and Verizon Communications, provides criteria for creating or assessing online courses. Available at http://www.nea.org/technology/onlinecourseguide.html. Last accessed on Sept. 6, 2007.

[28] These SREB standards are available along with other key resources at http://www.sreb.org/programs/EdTech/SVS/index.asp. Last accessed on June 20, 2007.

[29] The audit system is explained more fully at https://apcourseaudit.epiconline.org. Last accessed on June 20, 2007.

[30] Optimal Performance, Inc., *Executive Summary 2005–06: The Florida Virtual School Stakeholders' Surveys* (Tallahassee, Fla.: Optimal Performance, Inc., 2006), 5–6.

[31] Learning Point Associates, *Virtual High School Program Evaluation, 2004–06* (Orlando, Fla.:

Virtual High School, 2007), 31–32. Available online only with registration at http://www.govhs.org/Content/WhyVHS-Publications. Site page last accessed on Sept. 17, 2007.

[32] Ibid., 28.

[33] Three states, Kansas, South Dakota, and Alabama, require a specific online teaching certification for teachers participating in online programs. In John Watson and Jennifer Ryan, *Keeping Pace With K–12 Online Learning: A Review of State-level Policy and Practice* (Vienna, VA: North American Council for Online Learning, 2006). Available at http://www.nacol.org/docs/Keeping%20Pace%20with%20K-12%20Online%20Learning%202006.pdf. Last accessed on June 19, 2007.

[34] SREB, Educational Technology Cooperative, *Standards for Quality Online Teaching* (Atlanta: SREB, 2006). Available at http://www.sreb.org/programs/EdTech/pubs/PDF/06T02_Standards_Online_Teaching.pdf. Last accessed on Aug. 11, 2007.

[35] Virtual High School, "New Teacher Survey Responses, 2005–2006" (internal document) (Orlando, Fla.: Virtual High School, n.d.).

[36] To see this self-assessment, use the *Is Online Learning for Me* link under Academic Advisement at http://www.flvs.net/students_parents/index.php. Last accessed on Sept. 12, 2007.

[37] This self-assessment is available on the COL Web site at http://www.col.k12.co.us/students/newstudents.html. Last accessed on Sept. 12, 2007.

[38] Available at http://www.education.uiowa.edu/belinblank/programs/ioapa/profile.html. Last accessed on Sept. 5, 2007.

[39] The Michigan Merit Curriculum guidelines for online learning require that students take an online course, participate in an online experience, or participate in online experiences incorporated into each of the required credit courses of the Michigan Merit Curriculum. Additional information is available at http://www.michigan.gov/documents/mde/Online10.06_final_175750_7.pdf. Last accessed on Sept. 5, 2007.

[40] Optimal Performance, Inc., *Executive Summary 2005–06: The Florida Virtual School Stakeholders' Surveys* (Tallahassee, Fla.: Optimal Performance, Inc., 2006), 3.

[41] Liz Pape, "VHS Quality Benchmark Indicators" PowerPoint presentation (Maynard, Mass.: Virtual High School, 2007), slide 7.

[42] Ibid., slide 13.

[43] College Board, "Summary Reports: 2006, National Report." Available online under "Exams by State" at http://www.collegeboard.com/student/testing/ap/exgrd_sum/2006.html. (Use National Report link.) Last accessed on Sept. 17, 2007.

[44] See note 14.

[45] The Public Good, Incorporated, *Colorado Online Learning, Final Evaluation Report, 2002–2005* (Lakewood, Colo.: Colorado Online Learning, 2005), 6; The Public Good, Incorporated, *Colorado Online Learning, U.S. Learning Online, Evaluation Report* (Lakewood, Colo.: Colorado Online Learning, 2006), 4. Both evaluations are available at http://www.col.k12.co.us/aboutus/evaluationreports.html. Last accessed on Sept. 17, 2007.

[46] The Public Good, Incorporated. *Colorado Online Learning, U.S. Learning Online, Evaluation Report,* 34.

[47] Firewalls prevent access to certain Web sites and do not allow "pop-ups," such as certain media players. Several program leaders reported that improperly set firewalls are a common problem, leading the school's online learning coordinator or the student to think something is wrong with the platform or the course when, in fact, the firewall settings simply need to be adjusted for the course to function properly.

[48] College Board, *AP National Summary.* 2001. Available online under "Summary Reports" at http://www.collegeboard.com/student/testing/ap/exgrd_sum/2006.html. Last accessed on Sept. 12, 2007.

[49] Ibid.

[50] The Concord Consortium, n.d., "Our Mission." Available at http://www.concord.org/about/mission. Last accessed on Nov. 12, 2007.

[51] Nikola Filby, "Approach to Methodological Rigor in the Innovation Guides," working paper, WestEd, San Francisco, Calif., 2006.

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