Center for the Application of Information Technologies
College of Education and Human Services
Western Illinois University, Macomb, IL 61455
Contact: Michael Dickson, Executive Director
309/298-1907 *michael_dickson@ccmail.wiu.edu*

Virtual High Schools:
State of the States

A Study of Virtual High School Planning and Operation in the United States

March 2000

By:

Tom Clark, Ph.D.
Transformational Associates
920 S. Spring, Suite 311
Springfield, IL 62704
Phone: 217/546-5947
Email: *tomclark@fgi.net*

Commissioned by:

Michael Dickson, Executive Director
Center for the Application of Information Technologies

Virtual High Schools: State of the States

TABLE OF CONTENTS

.

Acknowledgments

I would like to thank Mike Dickson, Executive Director of the Center for the Application of Information Technologies at Western Illinois University, for having the foresight to commission this study. Special thanks go to Kathy Lawhon of CAIT for her assistance throughout this project in researching virtual high schools, locating and interviewing contacts, and creating excellent web-based resources and descriptive tables of virtual high school contacts. Her tables are cited in this report, and the web resources she has developed are included as an appendix.

Thanks are also due to the staff of the Center for the Application of Information Technologies at Western Illinois University, and to Associate Director Richard Chamberlain, who heads Ms. Lawhon's section within the organization. David Taylor, Dean of the College of Education and Human Services, has positioned WIU as a national educational technology leader by supporting CAIT and other initiatives within the College. Finally, thanks to the representatives and member institutions of the P-16 Partnership, especially Keith Sanders and the Illinois Board of Higher Education, for supporting the creation of a Virtual High School in the state of Illinois.

About the Author

Dr. Tom Clark has been a consultant to government, education and business since 1992 as the principal of Transformational Associates, a research and evaluation firm located in Springfield, Illinois. His areas of expertise include strategic planning, program evaluation and distance learning. Clark holds a M.S.Ed and a Ph.D. from Southern Illinois University at Carbondale, with a specialization in academic administration. He is the author or co-author of numerous studies as well as professional articles, the book *Distance Education: The Foundations of Effective Practice* (Jossey-Bass, 1991), and a recent Phi Delta Kappa Fastback, *Distance Learning, Electronic Networking, and School Policy* (PDK, 1998).

Virtual High Schools: State of the States

By Tom Clark, Ph.D.

Abstract

This study, commissioned by Western Illinois University (WIU), profiles the approaches of 5 states (Florida, Kentucky, Michigan, New Mexico and Utah) in developing a "statewide" virtual high school (SVHS). Illinois is planning a virtual high school, and the context for this initiative is also briefly described. The study also looks at other leading virtual HS projects, and for-profit corporate initiatives. It provides analysis on several key forces driving state interest in virtual high schools. Driving forces include state and federal initiatives, curriculum equity concerns such as Advanced Placement, and unique state attributes. The study includes descriptive analysis of key characteristics of some leading virtual high schools, such as development and delivery platforms, enrollments, and programs offered. Recommendations are provided for states considering the establishment of virtual high schools or similar opportunities. An appended virtual high school resource, and descriptive tables of key attributes, were researched and compiled by Kathy Lawhon of the Center for the Application of Information Technologies, College of Education and Human Services at WIU, with the assistance of the study author.

Executive Summary

This brief report is intended to identify and describe key characteristics of "statewide" virtual high schools (SVHS) designated by state government, as well as leading examples of other kinds of virtual high schools. It seeks to establish some "lessons learned" which may be useful for those in Illinois and other states planning or considering similar state-level initiatives. The report may also be of interest to those planning other kinds of virtual schools. Virtual high schools are very diverse in their purposes and characteristics. The development of a "statewide" virtual high school in a given state appears dependent on factors such as leadership by the Governor, educational and technology infrastructure, and the policy context of the state.

A "virtual high school" is here defined as "a state approved and/or regionally accredited school that offers secondary credit courses through distance learning methods that include Internet-based delivery." Internet-based or online learning is the "next wave" in technology based K-12 education, joining proven distance learning delivery methods such as videoconferencing and television. Many university-based virtual high schools have built their virtual foundations upon independent study, the first generation of distance learning.

States that are currently operating or planning SVHS systems were identified through research and interviews, as were other virtual high schools that might serve as useful models. Commercial outsourcing providers used by the various states and model virtual schools were also studied. Brief profiles were developed of "statewide" virtual high school development in four states --Florida, Kentucky, Michigan and Utah-- as were short descriptions of relevant aspects of other selected virtual high schools.

In terms of "statewide" virtual high school systems, current activities include:

- **Florida**. The Florida High School, begun in 1997, has expanded state funding and may become a separate entity in FY2001, has a full online curriculum
- **Illinois**. Planning is underway for the Illinois Virtual High School, which will be funded through a special FY2001 appropriation to the Illinois Board of Higher Education
- **Kentucky**. The Kentucky Virtual High School began operation in January 2000, with a blend of licensed and self-developed online courses, taught by Kentucky teachers
- **Michigan**. The Michigan Virtual High School and Advanced Placement Academy are being planned, and will be funded via a FY2001 appropriation to Michigan Virtual University
- **New Mexico**. A virtual high school to be run by the Department of Public Education is in the FY2001 budget, and appears likely to survive budget cuts due to universal support
- **Utah**. The Electronic High School began in 1994, acting as a course broker for a variety of technology-based courses, and is now completing an online core curriculum

Two other highly successful initiatives, while not "statewide" state government efforts, are:
- **Massachusetts**. The Concord Virtual High School (VHS), the most successful collaborative or barter model of virtual high schools in existence, in the 4th year of a 5-year federal grant
- **Nebraska**. The CLASS online degree courses developed by the Independent Study High School of the University of Nebraska-Lincoln with a federal grant, and marketed through the for-profit CLASS.com

Some key characteristics of "statewide" virtual high schools were analyzed. Findings of this analysis are summarized below, according to nine aspects of virtual high school organization: technology; funding; curriculum; student services; professional development; access and equity; assessment; policy and administration; and marketing and public relations.

"Statewide" Virtual High School (SVHS) Characteristics: Summary	
Technology	Experimentation is underway in SVHS systems with several major web-based learning platforms. Unique state issues related to enrollment capacities sought, in-house technical resources, partnerships, likely teacher and user characteristics, etc., are factors in the choice of development and delivery software. Some seek to provide "one-stop" access to courses offered by a variety of technologies within a statewide educational technology system.
Funding	Most states are combining funding through a state agency with tuition. Barter models are seeking annual fees from affiliated districts, which have a local impact similar to tuition. Alternative funding structures are not readily apparent. Sustainability strategies are a key concern for many systems.
Curriculum	Curricula offered by SVHS are mainly supplemental to regular instruction, but most will offer alternative diploma options eventually. Wide range of courses available, most not aligned to state or College Board standards. Market demands induce "mission creep" in who is served and why.
Student Services	Student services are handled quite differently in different states. Some place almost all responsibilities on districts, while others have a centralized approach. Some offer virtual library access, online counseling, other virtual services while others arrange in-person services.

Professional Development	Leading schools are taking different approaches, ranging from extensive online training to extensive in-person training, using both in-house and vendor capabilities. No single clear model has emerged.
Access/Equity	Concerns about equitable access to public education are important drivers in most SVHS states. Several have developed policies to encourage SVHS participation by at-risk and rural students.
Assessment	Two largest stand-alone virtual high schools have extensive internal and external assessment structures.
Policy and Administration	Clear agreements and commitments between the various parties involved in administrative services are apparent in most successful models. Some excellent policy examples are freely available from leading models
Marketing and Public Relations	Major models all have fairly sophisticated approaches to marketing their offerings to potential users, and disseminating information to key stakeholders and opinion leaders.

Based on an analysis of virtual high school characteristics, "lessons learned," and key drivers of virtual high school development, recommendations are made for those planning "statewide" virtual high school systems. These recommendations are briefly summarized below.

Recommendations for SVHS Planning: Summary	
Technology	Consider all technology options in relation to likely needs over the next two years, and think strategically and flexibly about technology over time. "One-stop" access to a variety of technologies should be considered to maximize return on the state's educational technology investments.
Funding	Consider funding implications early on, including the cost/benefit to local districts for participating, and seek to identify as early as possible the most sustainable funding mechanisms in your state.
Curriculum	In deciding on course licensing and course development parameters, consider the main purpose of your curriculum in terms of state specific needs, and the likelihood of future external course sharing.
Student Services	Form alliances to provide student services, and involve local districts in decisions about the extent of local responsibilities.
Professional Development	Consider a mix of methods for providing teacher training, leveraging existing resources wherever possible, and creating incentives for participation.
Access/Equity	Prioritize the access/equity concerns most relevant to your state, and create strategies for reaching at-risk populations and providing AP access.
Assessment	Create an internal formative assessment structure, and use external evaluation with reports timed to fit the state legislative cycle.
Policy and Administration	Adopt and adapt from existing virtual HS policies and procedures, while seeking to ensure a good fit with unique state circumstances.
Marketing and Public Relations	Develop a comprehensive marketing strategy, working collaboratively with partners, including enrollment strategies for users, and public relations strategies for stakeholders, funders and opinion leaders, while working to keep their expectations in line with achievable goals.

Introduction

This study is intended to identify and describe "statewide" virtual high schools (SVHS) largely funded through state government, as well leading examples of other kinds of virtual high schools. It seeks to establish some "lessons learned" which may be useful to those in Illinois and other states who are planning, or thinking about planning SVHS systems. It also may be of interest to those planning virtual schools with different scopes.

Virtual high schools are very diverse in their purposes and characteristics. The development of virtual high schools in each state appears dependent on factors such as the structure of higher education and of associated independent study high schools, traditional state roles in K-12 education, and state experience with policy issues such as equitable access. Virtual high schools serve many purposes, explicit and implicit. In several cases, state agencies have been charged by the Governor with creating a virtual high school, often as part of a broader policy initiative. As planners have sought to implement such broad charges, they have often encountered unique issues or needs.

A statewide virtual high school (http://ivhs.org), as well as a virtual community college, are in the planning stages in Illinois, with full-scale funding likely to be appropriated for FY2001. The state is also funding completion of the Illinois Century Network, described as a "telecommunications backbone to provide high-speed access to data, video, and audio communications in schools and libraries, colleges and universities, museums and state agencies, in the workplace, and in the home" in the Technology section of the IBHE Web site. The site provides good detail on the Illinois context for technology-based education (http://www.ibhe.state.il.us/tech/index.htm). The proposed FY2001 budget of the Illinois Board of Higher Education includes a special appropriation of $853,900 to create the Illinois Virtual High School (IVHS). A planning grant of $30,000 has been awarded by IBHE to a consortium of educational institutions, to prepare for IVHS full-scale development activities that will begin July 1, 2000. The IVHS is a P-16 partnership activity of the Board of Higher Education, State Board of Education, and Community College Board, working with the state's education, government, library and business communities. Details about the Illinois P-16 Partnership are included in the meeting materials of the IBHE, posted to the Web at (http://www.ibhe.state.il.us/calendar.htm).

Definitions

The terms "virtual high school" and "virtual school" have become buzzwords, frequently applied to any K-12 learning activity or program that uses the Internet or other technologies. If you ask 30 people to define a "virtual high school," you will probably get 30 different answers. A "virtual high school" is here defined as "a state approved and/or regionally accredited school offering secondary courses through distance learning methods that include Internet-based delivery." Distance education might be formally defined as "formal education in which a majority of instruction occurs while teacher and learner are separate" (Verduin and Clark, 1991). Distance education or distance learning use delivery methods that include independent study, also known as correspondence study or study by mail, as well as videoconferencing, Internet,

and computer-assisted instruction, and other instructional technologies. These days, most writers are thinking only of the electronic delivery methods when they use the word "distance." "Virtual" began as a term for computer-based simulated real-time environments, such as "virtual reality." A few years ago, "virtual learning" was used synonymously with "distance learning" to describe instruction delivered remotely via technology, but now it is increasingly used to refer to Internet-based learning.

From Independent to Virtual Study

A variety of distance learning technologies currently provide K-12 credit course opportunities. Independent study "is the oldest form of distance education and still enrolls more K-12 students than any other forms" (Clark and Else, 1998). Many universities offer K-12 independent study through independent study high schools in their continuing education divisions. In 1995-96, there were nearly 140,000 high school course enrollments in the 40 largest college and university independent study programs approved by the University Continuing Education Association (UCEA, 1997). Total K-12 enrollment through accredited schools, colleges and universities and state education agency programs may be twice this number. All of the universities currently developing online high school programs are long-time UCEA members.

Telecourses are also a major source of dual enrollment and early college credit for K-12 students. They are delivered via broadcast TV, cable television, and videotape, often using independent study methods for teacher-learner interaction. Live or taped satellite videoconferences and television broadcasts, with one-way video and two-way audio, have also become an important source of K-12 credit learning. About one fifth of schools have access to satellite videoconferencing technology. Major providers such as StarNet, ASTS, MCET and SERC work with specific groups of states to deliver courses to K-12 schools via satellite. A number of states, including Iowa, North Carolina, and Utah, have developed or are developing videoconferencing networks connecting classrooms with two-way video and two-way audio. One of the main purposes of these networks is course sharing among K-12 schools. Other technologies play important roles in providing supplemental opportunities. These include one-way only video satellite programs offered by providers such as Channel One, NASA and SCOLA, and computer-based media such as CD-ROM, and Internet-based content resources. Virtual schooling is the "next wave" of distance education. (Clark and Else, 1998). It may be characterized as a convergence or blending of technologies, centering on use of the Internet and World Wide Web. Online courses use the Web to carry most course content, supplemented by email, telephone and often by traditional textbooks and course materials. Part of the promise of the World Wide Web is distributed education within a learning community, where learning can occur "anytime, anywhere," using distributed knowledge resources and virtual interactions and simulations (Dede, 1996).

In the following section, profiles are presented of four statewide virtual high schools efforts -- the Florida High School, the Kentucky Virtual High School, the Michigan Virtual High School, and the Utah Electronic High School. Besides the four statewide virtual school initiatives profiled in this report, another is now on the drawing board in New Mexico. An update to this study may be created, to provide a profile of the actual beginnings of the virtual high schools in New Mexico, Illinois and Michigan, after their funding begins in FY2001.

Profile: Florida High School

Florida was the first state to directly fund a statewide virtual high school, the Florida High School (FHS), with Orange County Public Schools acting as the fiscal agent. The Florida High School's goal is to provide a complete high school curriculum online by the year 2001, including services that will enable students to successfully transition to postsecondary education institutions and to the workplace. While the original 1997-1998 staff and students were limited to Orange and Alachua counties, FHS currently has affiliated personnel from 17 counties and is serving students statewide. In spring 2000, over 1900 students were registered through 65 public school districts, private schools, home schools and charter schools.

The school targets students from public rural and low-performing schools (those receiving a 'D' or 'F' on the state's school performance report card), by allowing them to register first. Registration is opened to public school, private school and home school students two weeks later. FHS offered 52 high school courses online in Spring 2000, including Advanced Placement and college preparatory courses, and plans to offer the full core curriculum needed for a high school diploma by Fall 2000.

FHS was initially a partnership of Orange and Alachua county school districts. Business partners have included IBM, which provided technical and curriculum training in their Lotus Learning Space product, and content providers such as World Book Encyclopedia Company, which provided CD-ROMs at $2 per copy for all students of FHS. The Florida High School staff maintains contact with their students via the Internet, E-mail, and telephone. Supplemental course materials are provided to the student at no charge to use while they are taking a course. Students must register through one of the 65 affiliated public school districts, private schools and charter schools. Affiliated districts agree to accept credits from FHS, collaborate on AP exams, and provide a district coordinator. All courses are free to all students in the state of Florida. A pilot was done this year with students from out of state enrolling in FHS's AP Calculus course and SAT Prep. These out-of-state districts paid a tuition of $300 per semester course, $600 for calculus (2 semesters).

The Principal and Assistant Principal are housed at the central office in Orlando along with some members of a support team that includes technical, curriculum and research specialists, three regional coordinators, and counselor. All positions with the school are full-time, as a result of issues encountered in working with part-timers. Administrative staff members work "virtually" with district coordinators. FHS employs over 30 full-time online high school teachers, all Florida certified, a majority from the Orlando area. Learners served include public, private and home school students. In 1998-99, only about four percent were minorities, but minority student participation has increased to about 17 percent in 1999-2000. A focus on advanced coursework means that most students are high achievers, but special efforts to recruit students from rural and low-performing schools (often in low-income, high-minority urban areas) appear to be paying off.

FHS is currently using Lotus Learning Space for course development, and Lotus Learning Server for course delivery, but it is exploring alternatives due to scalability and speed issues, with an eye to building a system robust enough for a capacity of 5,000 enrollments, over double their

current capacity. If a student takes a FHS course from within a school setting, the affiliated school must provide access to a multimedia computer with Internet access. Students requesting the extended pace option (see below) must obtain both counselor and parental permission to ensure adequate online access. All courses must meet the content and achievement goals in the Florida Sunshine State Standards as well as pass a Peer Review. A Peer Review Team is established for each course and consists of subject matter experts, Department of Education personnel, business and community members and high school students.

The school has developed an extensive in-house training and mentoring capacity. It has a philosophy of "teach first, develop later." New full-time teacher hires attend a two-week in-person seminar that follows an engaged learning format, reviewing current courses and receiving training. They then teach an existing online course with online monitoring and feedback from a mentor who is teaching in the same course shell. Teachers learn to edit within the course as they teach it. After the course is completed successfully, they receive advanced training in course development and can submit a request to develop a class. All staff members have the flexibility of working from the central office or working from home.

Florida High School began its needs assessment activities with a 1997 survey of Superintendents across the state, asking specifically about Advanced Placement offerings and needs, and other courses of interest, repeating this process yearly. They documented a strong need for AP courses, especially in rural areas, and in 1998-99 offered the top five AP courses requested by districts. Student needs and responses to courses are studied in mid-course and at course completion through surveys embedded in course content. A strong internal and external evaluation effort is underway. External evaluation activities have been conducted by Florida State University's Center for Teaching and Learning since January 1999. The Center has submitted evaluation reports to the state legislature, beginning in March 1999. FHS administrators believe the external evaluation has been helpful in meeting accountability concerns and receiving further state funding. Extensive public relations and dissemination efforts have helped the school keep a high visibility with state funders. About 30 states and several other nations have sent delegations to visit the FHS.

While the school motto is "Any time, any place, any path, any pace," problems with course completion have led the school to replace their open pacing model with three alternative paces for completion - accelerated, standard and extended. "We had students who literally were in a one semester course for two years," said FHS Principal Julie Young (Young, 2000). Assistant Principal Bruce Friend observed that "Students really like the structure of knowing where they have to be in a course" (Friend, 2000). The three pacing options are linked to the semester system, with the extended option adding 9 weeks. Parent and school permissions are required for students selecting this option. Staff workload turned out to be higher than expected, with most full-time FHS teachers finding that the teaching method, with extensive individualized interaction with students, led to a longer workweek. FHS administrators and staff are continuously working on techniques for better time management in this individualized environment.

In November 1999, Florida Governor Jeb Bush announced the "One Florida" plan, which bans race and gender-based preferences in college admissions, and guarantees state university

admission to the top 20 percent of students in every Florida high school. As part of One Florida, Governor Bush proposed an additional $2.4 million appropriation to the Florida High School in FY 2001, to expand access to advanced college preparatory coursework, including Advanced Placement courses. Following protests, sit-ins and large-scale turnout at public hearings by citizens concerned about the implications of One Florida for minority education, Governor Bush announced several additions to the One Florida Initiative in February 2000. These included the creation of the One Florida Accountability Commission, which will conduct a comprehensive review of the Talented 20 program's effectiveness in fall 2002. Another addition was a recommendation to "prioritize $30 million in instructional technology funding to provide low performing ('D' and 'F') high schools with the necessary computer equipment and Internet connectivity to access online AP courses." The Florida Board of Regents voted unanimously to approve the plan the same month. The plan will increase availability of Advanced Placement courses in low performing schools.

Currently the Florida High School is funded through a legislative line item appropriation to the State Department of Education, which increased from 3.8 million for FY 1999 to 6.2 for FY 2000. Legislation being proposed this year would establish the school as a separate entity.

Profile: Kentucky Virtual High School

Governor Paul Patton created the Kentucky Virtual High School (KVHS) as a program within the Department of Education in October 1999. KVHS is the first statewide, stand-alone online high school in the nation to be directly established as part of a state agency, leading Patton to describe it as the "first ever statewide virtual high school." KVHS is described on its home page as a "statewide educational service delivering high school courses and online opportunities ... to public high schools through the Kentucky Education Technology System." KVHS is funded through a special appropriation from the state general fund for the 2000-2002 biennium of 1.5 million, or $750,000 yearly.

January 2000 was the first semester of enrollment, and no figures are currently available. KVHS online courses were immediately available to students statewide through 178 public school districts, which include 350 high schools. Course availability will be expanded to 215 middle schools, home school students, and students enrolled in non-public schools beginning in fall 2000. Currently, KVHS targets all students enrolled in Kentucky public schools. The focus of KVHS is on helping Kentucky schools complement their curriculum. Toward this end, it offers general required courses, electives, and AP courses. The local school awards the credit earned through KVHS courses. Tuition for KVHS is $300 per 1/2 credit course for Kentucky public school students, which normally is paid by the school district. Courses were not open to students outside the state in spring 2000.

For their initial semester, ten courses have been licensed from Nebraska's for-profit CLASS. Three more were developed by a unit within Kentucky Educational Television (KET), using eCollege's eTeaching Solutions, where three more are under development. Another 8 courses were obtained from other sources. In developing the courses, KET worked with instructional

design staff from the Kentucky Department of Education, as well as teachers and content specialists from around the state, to review course content and align it with state standards.

In Kentucky, as in Utah, officials have sought to position the Virtual High School as part of a convergence of technology options made possible by the state's extensive educational technology infrastructure, the Kentucky Education Technology System. "For large classes, we have been able to deliver coursework via satellite," Ginny Fox, Executive Director and CEO of KET, told the Lexington Herald-Leader (Blackford, 1999). "But that is really inefficient for the one or two students who may need a class."

KVHS views eCollege as its primary commercial vendor of education services needed for virtual school startup. Kentucky teachers hired to teach online for the initial semester (January 2000) attended a 4-day on-site training program with eCollege, to learn course development and delivery skills, including pedagogy for online teaching. They are also participating in continuing education online with eCollege. The teachers also attended a day and a half workshop with a representative from the main outside content provider, CLASS, to learn skills in course delivery using the proprietary CLASS system. The teachers were initially recruited with the understanding that they would be providing extensive formative feedback on the training and delivery systems, through informal feedback and formal surveys, that would assist in making future decisions for course development and delivery.

"We have a very strong partnership with the Commonwealth Virtual University (CVU)," says Linda Pittenger, , Interim Principal and Director of Planning in the Kentucky Department of Education. "We're sister programs" (Pittenger, 2000). KVHS and CVU have some shared student support services, such as the Kentucky Virtual Library, and have sought to maintain a similar look and "feel" in their web sites. Another key linkage with CVU is in marketing. In spring 2000, CVU issued a request for proposals for a major marketing effort, that will include shared marketing with KVHS. However, the two virtual schools are distinct entities.

The state is currently conducting surveys of school districts on the kinds of courses they would like to see offered through KVHS. Because of the rapid startup following the Governor's decision in Fall 1999, leading to implementation in Spring 2000, there was literally no time for prior needs assessment, according to Pittenger. However, the inquiries they have received about course availability and partnership opportunities have been quite revealing. Pittenger has been surprised by the "huge need" for high school programming in alternative schools. Many alternative school students "are quite bright, and consider [KVHS course access] a privilege and a motivation," she says. Similarly, she believes that online learning appears quite motivating for at-risk students in high school preparatory classes, such as middle school algebra. Because the state tests have shown low scores on language and math for middle schoolers, KVHS has been asked by the Department of Education to support a middle school initiative through online opportunities.

Pittenger would like to see an initiative linking AP to middle school, such as articulation of an online curriculum leading from middle school Spanish to AP Spanish. She says there has also been a high volume of inquiries about home schooling opportunities through KVHS. Home and private school students will have the opportunity to enroll as part-time students through local

public high schools beginning in fall 2000. In return for facilitating registration by these students, public school districts will receive partial funding under the Americans with Disabilities Act. KVHS is also exploring the roles it can play in alternative education. For example, it is considering involvement in adult literacy initiatives and juvenile correctional education in residential facilities. These activities may require approaches to delivery and enrollment outside the public-high-school-centered model currently in use.

Kentucky has 325 high schools, mostly small and rural. KVHS is working with a state Education Equity Task Force to ensure that the KVHS effectively markets its offerings to schools in urban areas with large minority populations, less affluent schools in areas such as the Appalachians, and schools with high dropout rates and other at-risk student characteristics. Part of the mission charged to KVHS by Governor Patton in fall 1999 was to improve access to Advanced Placement courses for Kentucky students. The state funds an AP incentive program, the Commonwealth Diploma, in which students who take four AP exams and receive a passing grade of '3' or better may receive a need-based college scholarship. The state also reimburses test fees for low-income AP exam takers. Pittenger estimates that a third of Kentucky high school students do not have the opportunity to compete for the special diploma because the necessary AP courses are not available to them. AP Language courses are especially limited in availability, she said. KVHS is participating in a proposal for a federal AP Incentive Program grant that would offer online AP course opportunities to at-risk populations. It is also discussing possible advanced placement courses for fall 2000 with Apex, which likely would be funded through such a grant.

Because KVHS is not a system in which districts must sign agreements to affiliate, as in the Florida High School or Concord VHS, all districts are eligible, which can create interesting problems in terms of student interest in registering versus district interest in paying and paperwork. Pittenger notes that, "We don't want cost to be a barrier. The fee is a problem; we know it is keeping kids out of the program." However, they need the fees to cover licensing costs and teacher salaries, while funding administrative costs through the state appropriation. Districts have the option of paying course fees out of educational technology appropriations from the state, but for some districts, this may make it appear that KVHS classes are competing with other technology options, such as more computers and teacher training. KVHS would like to find a more stable source of funding for teacher salaries, and over the long term, to decrease their licensing costs through internal courseware development. Unlike some other virtual high schools, Kentucky is not currently focusing heavily on marketing out of state as a funding continuation strategy. Part of the reason is that they have so far focused on development of "Kentucky-specific" courses and curriculum resources that cannot be obtained through national vendors. However, with the current funding structure, Kentucky may need to rethink its "outside" options.

Because the KVHS is starting without time for pilot testing, Pittenger is encouraging districts to go slow in enrolling students in KVHS. Much of the support for KVHS courses, such as curriculum counseling, will occur through the local high schools. Enrollment is open to students in any public high school, so local administrators do not have to sign the kinds of formal agreements on roles and responsibilities found in the Concord VHS or the Florida High School. They do, however, have to provide proof that students meet certain criteria for enrollment.

The state's main teacher union, the Kentucky Education Association, has been supportive of KVHS, and involved in planning efforts from the beginning. However, Judith Gambill, president of KEA, joins Pittenger in taking a tone of caution and moderation regarding students. "This will take a very mature student," Judith Gambill, president of the Kentucky Education Association, told the Lexington Herald-Leader (Blackford, 1999). "This is the icing on the cake for those accelerated students, wherever they go to school." Since the focus of KVHS is on supplemental offerings that may help keep small schools open, fears of teacher replacement appears not to have been a major factor in Kentucky.

Profile: Michigan Virtual High School and Advanced Placement Academy

In his State of the State address in January 2000, Michigan Governor John Engler proposed a budget of $15 million to support the Michigan Advanced Placement Academy and a Virtual High School. Through these two initiatives, he proposed "to expand educational opportunities for all high school students through an interactive, multimedia Internet-based, educational delivery system across Michigan" (Engler, 2000).

Start-up funding of $15 million would be provided in fiscal year 2001 for this initiative, along with ongoing support of $1.5 million in fiscal years 2002 and 2003. The Michigan Virtual High School is intended to provide high school students with opportunities for advanced placement courses, dual enrollment, and access to information technology certification programs and other advanced technology courses. The virtual high school initiative in Michigan has its origins in Advanced Placement, as it has in several other states. The initiative can be traced back to February 1998, when the Governor followed up on recommendations made by an Education Technology Advisory Group by announcing a 7-step Technology Empowerment Plan. The plan called for the establishment of an Advanced Placement Virtual Learning Academy and creation of the Michigan Virtual University (MVU). In calling for creation of the MVU, Engler charged it with overseeing the implementation of the advanced placement academy.

In July 1998, Governor Engler appointed David Spencer as president of the newly founded Michigan Virtual University (MVU). Comparing it with similar virtual university efforts in other states, Engler claimed the MVU was unique, because "its initial focus is to train workers for specific core industries in the state." Building upon the success of the Michigan Virtual Automotive College (MVAC), the MVU acts as a "one stop learning portal," brokering education and training opportunities for Michigan's core industries and their current and potential employees. MVU does not issue its own degrees or certificates. The MVAC, formed in 1996, has become the first of five evolving "industry-specific" divisions of the Michigan Virtual University, along with automotive, information technology, health care, finance and professional services. A separate unit for education may arise, as MVU undertakes the Governor's charge to oversee the implementation of K-12 technology initiatives, such as the Advanced Placement academy, teacher training and online learning.

While the Governor challenged the state's higher education institutions in February 1998 to create the Advanced Placement academy, so that AP courses would be available "regardless of

location"; direct funding was not apparent in the FY1999 budget. In his January 1999 State of the State address, Engler detailed four specific steps to enhance student and parent choice in Michigan, again asking the state's colleges and universities to "[work] with Michigan Virtual University to allow all students, regardless of where they live, access to Advanced Placement courses." However, the extent of collaboration in "virtual high school" and AP initiatives, given the lack of direct funding, appears to have been somewhat limited. Some related efforts did appear, most notably at Michigan State University. The university, which has a long-standing relationship with the College Board through its research on AP testing, has used Technology Literacy Challenge Grant funding from the State Department of Education to develop online AP courses. In fall 2000, Michigan State's own Virtual University will offer Advanced Placement Microeconomics, English, Chemistry, and Physics through online courses. The university is also using federal funding for online support and to sponsor a colloquium on online AP courses in Michigan, in spring 2000.

Leveraging funding from a 1999 grant under the U.S. Department of Education's Advanced Placement Initiative Program, MVU paid for 100 one-semester course scholarships for high school students taking one of four AP courses online from Apex Learning during the 1999-2000 school year. These Apex online courses can be considered the first offering of the Michigan Virtual High School. As part of the scholarship program, Michigan Virtual University is working collaboratively with the Michigan Institute for Educational Management and two administrator associations to offer small stipends and free, but required, training to the educators that serve as on-site mentors for the student(s) participating from their particular building. The on-site mentors receive weekly reports on student progress, serve as coaches for the student(s) and act as the communication link between the school and the on-line AP instructor to resolve problems and to assist with general student needs. While the Apex Learning site suggests MVU has selected Apex "to meet one of their strategic goals -- to expand the accessibility of Advanced Placement (AP) courses," it is unlikely a broker like MVU will put all its eggs in one basket.

Jamey Fitzpatrick, Vice President of Development and Education Policy, leads the Advanced Placement academy and virtual high school initiatives for MVU. MVU is currently developing an agenda for K-12 initiatives. He previously was technology officer for the State Department of Education. However, MVU will also participate in the leadership of the massive teacher training effort announced by the Governor Engler in his January 2000 State of the State address. In it, Engler proposed budgeting $110 million over two years to provide training to teachers on effective use of computers and technology in the classroom. The state's 80,000 public school teachers will be eligible to receive laptop computers and Internet access upon completion of a technology training program. Brokering access to dual enrollment courses is also a concern for Fitzpatrick, who notes that "Michigan has wonderful dual enrollment legislation, but not everyone lives next to a college (Fitzpatrick, 2000)." Besides AP, dual enrollment, technology certification, and alternative education, MVU may also provide smaller "niche" courses online, "special interest courses that you wouldn't typically find in any given high school," according to Fitzpatrick. MVU hopes to explore options for moving beyond brokering to actual course development and delivery after its formative phase.

The Governor has also put money from the state's tobacco settlement into needs-based college scholarships for high school students who perform satisfactorily on the state's achievement tests.

Fitzpatrick sees an important role for MVHS in providing at-risk populations with online learning opportunities, including remedial support, that will help them pass the tests and go on to college. They will also consider development of a GED preparation program. MVU is exploring different ways of conceptualizing its virtual high school, including in-school and alternative school offerings, fee-based and barter-based (like the model pioneered by Concord VHS), public sector and private sector, and full degree online versus supplemental resource. At least initially, the Michigan Virtual High School will focus on providing supplemental resources, rather than creating on a full high school curriculum. As MVU assists with statewide teacher technology training, it also hopes to develop models for training online teachers.

Profile: New Mexico Virtual School

The New Mexico Virtual School presents interesting parallels -- and differences -- when compared with the virtual school planning activities conducted in other states. If established, it would be the first state-recognized statewide virtual school created with a mission to serve all of K-12, not just the upper grades. Like Utah and Kentucky, it would promote a blend of distance education delivery methods, while seeking to develop extensive web-based offerings.

Senate Bill 288 [enter '288' in Bill Finder at (http://legis.state.nm.us)], an emergency bill introduced in January 2000 for immediate enactment, would create the New Mexico Virtual School. A budget of $1 million is to be appropriated from the general fund to the State Department of Public Education to carry out the Act in FY2000 and FY2001. This is probably $350,000 in FY2000 and $650,000 in FY2001, based on the general appropriations bill. The bill had not been passed and signed as of late March 2000, but according to Steven Sanchez, Director of Curriculum, Instruction, and Learning Technologies in the New Mexico Department of Education, the bill has the support of both houses and the Governor. He believes it will be passed and signed despite a current budget-cutting standoff between Republican Governor Gary Johnson and the Democrat-controlled legislature. The funding would be used to design and implement a virtual school that would " offer a distributed learning model to provide all New Mexico students with an equal opportunity to develop a strong academic foundation." The bill calls for the creation of a 14-member "virtual school design and implementation team" as an advisory committee within the Department of Public Education. Two members will be appointed by legislative leaders, and the others by the State Board of Education, to represent superintendents, high school, middle school, and elementary school principals, parents, distance education teachers, charter schools, technology administrators, private schools, home schools, the Commission on Higher Education, and the State Board of Education. It would appear that this team is already in place but not officially funded, since it is called upon to complete its work by July 1, 2000. The team is charged with advising the Board on " all policies, strategies, organizational structures and other matters necessary to establish a virtual school," including

A professional development model for potential instructors
(1) The identification of a pool of qualified instructors;
(2) An implementation framework;
(3) Policies concerning student recruitment, enrollment and credit;
(4) Instructor compensation;

(5) Appropriate courses for a virtual school;
(6) Methods to ensure accountability; and
(7) Future funding options and budget needs.

The State Board of Education is established as the policy-making body, and called upon to

(1) Successfully implement a virtual school that will capitalize on the existing and expanding technical infrastructures to:
    (a) provide curriculum and instruction statewide through a variety of interactive technologies; (b) offer web-based and other forms of interactive distance-learning courses from certified skilled instructors; and (c) allow students to interact with peers and classmates and receive the quality education they need to pursue further study;
(2) Enhance and expand learning opportunities based on the New Mexico content standards and benchmarks
(3) Provide a vehicle for professional development for teachers.

Progress reports are called for at the end of each fiscal year and calendar year, to be submitted to a legislative committee and the legislature, respectively. A total of 3.0 FTE staff is to be hired, including a virtual school administrator. In a fiscal impact report, legislative staff detailed several "significant issues" to justify the fiscal expenditure in the Act. They noted that over half of the state's 89 school districts enrolled less than 1000 students, and therefore had difficulty offering a full curriculum. It notes a recent State Department of Public Education study showing that 75 percent of public school instructional classrooms were connected to the Internet. The fiscal impact report does ask one interesting question: "Will the fifteen or sixteen month period called for in the bill be sufficient time to establish the virtual school?" It would appear unlikely that the design team can dissolve on July 1, 2000, in any case.

Profile: Utah Electronic High School

Utah's Electronic High School (EHS) began in 1994 as an initiative of the State Department of Education, in response to a challenge from Utah Governor Mike Leavitt to provide access to every high school core course via technology. According to federal figures, public school enrollment in Utah may increase by as much as 25 percent over the next decade. Utah Governor Leavitt, a co-founder of the Western Governor's University (WGU) has been a great proponent of using technology to serve the state's growing educational needs, including the proposal of a Utah Electronic College in the FY2001 budget, for distance learning program development by the state's public higher education institutions.

The Electronic High School acts as a clearinghouse, brokering access to high school courses by a variety of technology-based options. From the beginning, EHS has used a blend of technologies. A major partner is the Utah Education Network (UEN), a statewide consortium housed at the University of Utah, which develops or provides many of the courses offered through EHS. Utah Education Network operates the state's video and data networks, EDNET and UtahLINK, which deliver courses and Internet connections to Utah schools and colleges. They also recently began course delivery via digital satellite videoconferencing. UEN and the Department of Education

are separately funded state government entities. The budget for EHS is hard to compare with that of the Florida High School or Kentucky High School, because of the way it is set up. EHS administrative operations are conducted through the State Department of Education, where direct costs are estimated at $140,000 a year, and are limited to salaries and benefits of the Principal, Richard Siddoway, and his administrative assistant. EHS acts as a broker for course related functions performed mainly by the Utah Education Network, which are funded out of a larger program appropriation to UEN. As Clark and Else (1998) note, "state education agencies usually have a contact person for approval and referral to accredited K-12 independent study programs." The Utah Electronic High School may represent an evolution from this traditional SEA role. Siddoway might be considered the "Renaissance man" of virtual high school administrators. Besides serving as EHS principal, he also sits in the Utah House of Representatives and publishes novels through Random House. His legislative tenure provides him with a "bully pulpit" to support continued state funding of technology-enhanced education.

Because they are an open entry/open exit system, enrollment is calculated at the end of the fiscal year based on the total number of credits delivered. In 1998-99, about 1300 of the Electronic High School's 31,900 credits awarded for enrollments were completed online. The 31,900 enrollments are roughly equivalent to 4,600 high school students enrolled full-time (at an average seven credits per student), while the online enrollment translates to about 190 full-time students. Students enrolled through the Electronic High School come from all 40 Utah public school districts, 50 states and 14 other countries. In 1999-2000, EHS brokered credit for 54 television courses broadcast over public TV in Utah, 117 high school courses offered over EDNET, and 313 Internet courses, almost all from out-of-state providers. The Electronic High School charges tuition of $100 per course for non-residents, home schoolers, summer school students, and course repeaters, plus a $100 refundable deposit to cover damage/loss of books, tests, and videotapes. The courses are free to in-state students.

While EHS seeks to offer every one of the state's core high school courses, it focuses on a supplemental role. "The day may come where the Electronic High School may offer a diploma. But that's somewhere in the future," Siddoway said in a recent interview (Toomer-Cook, 2000). Currently, EHS seeks to provide an avenue for traditional and nontraditional students to finish high school early, take classes not offered at their schools, or take classes during summer vacation. Home schoolers have been an important audiences, and recently high school dropouts, registered through the local public high school for diploma completion, have also grown in number. Siddoway notes that "we offer all of the Utah secondary core, with the exception of band, orchestra, and other group performance classes (Siddoway, 2000)" The EHS also offers AP courses and concurrent enrollment courses. EHS students work independently. A mastery learning approach appears to be used, in which students may re-take exams until they score 80 out of 100. They communicate with the teacher through e-mail and on-line chat, having as much contact with the teacher as they desire (Chaika, 1999).

As in the Kentucky Virtual High School, counseling and awarding credits are the responsibility of local public schools, and private and home schooled students must enroll through a public high school in order to take courses. Many of the administrative functions that a "standalone" virtual high school might perform itself are performed instead through the Utah Education Network, which again bears similarities to Kentucky. UEN's EDNET video network has

established policies and procedures with most local high schools, in relation to their right to act as EDNET distance education sites. Most of Utah's 108 high schools have one or more EDNET studios. Requirements include local staffing and meetings over the EDNET system in the fall and spring with the school counselor, site coordinator, and a school administrator to discuss local needs and logistical and technical issues. These prior arrangements have been extended into other technology areas.

The Electronic High School is moving away from its reliance on out-of-state course brokering. "We found that they were expensive, did not meet the Utah core, and were largely repurposed correspondence courses," says Siddoway. This had led the Utah Education Network to take an approach similar to the University of Nebraska, creating its own software toolkit for developing and delivering web-based high school courses. EHS began offering the first two teacher-developed online courses using the UEN toolkit in 1998. From the beginning, UEN has incorporated innovative multimedia into its homegrown online courses, such as time-lapse images of cell division included one of its two initial offerings, a biology course (Harrington-Lueker, 1997). EHS , the Department of Education, and UEN has worked with groups of teachers through state Technology Literacy Challenge Fund (TLCF) grants to develop online courses that meet Utah core requirements. State TLCF programs administer federal pass-through money for technology integration projects. In selecting schools to participate in course development, priority is given to high schools serving low-income students or having a relatively limited installed base of technology and Internet access via UEN's UtahLINK network. Grants up to $10,000 were made to teachers in local districts to develop online resources and courses for the Electronic High School, "for students in Utah and across the country." In FY2000, 4 grants were made for developing online courses, and in FY2001 nine courses were funded through TLCF. While the districts selected FY2000 course topics, in FY20001 districts were asked to select a specific course to develop, from a specific list of nine courses needed to help complete the Utah core. A total of 21 online courses are currently under development, according to Siddoway, who expects all online courses needed to cover the Utah core to be completed by September 2000. The exception will be courses such as band and chorus, which involve group musical performances.

Utah Education Network plays a role in online course development using its toolkit, but the talents of high school students have also been harnessed. The UtahLINK network is the delivery mechanism for high school multimedia academies that focus on specialized fields (http://www.sun.com/eduSuccess Stories). "We found a lot of excellent teachers just weren't techies," Siddoway told an interviewer, "So now we say to them, 'we'll provide the technical expertise once you give us the [content]'" (Harrington-Lueker, 1997). For many of the online courses, teachers have developed content, but "hired" teams of students from these academies to create web pages and graphics, while other course development has occurred through UEN. The UEN toolkit has allowed project teams to include rich multimedia and interactive capabilities, such as audio and video streaming, chat rooms, and online testing in their courses.

Other Models

The Concord Virtual High School. The leading model of a cooperative approach to virtual high school development is the Concord VHS™, administered by Hudson (Massachusetts) Public Schools, with key functions shared with the Concord Consortium. Development of the virtual school has been funded by a 5-year, $7.5 million federal Technology Innovation Challenge grant that ends in October 2001. The largest surprise for Liz Pape, VHS Administrator for Hudson Public Schools, has been that "demand far exceeded supply " (Pape, 2000). In 1999-2000, 2393 high school students enrolled for VHS credit courses through 220 affiliated high schools in 28 states, the District of Columbia, and six other nations. This represents a great increase from 1998-99, when 35 schools were affiliated. The "barter" model of teach a class, enroll your students, has led to a wide variety of core and elective high school courses being offered, with 104 Netcourses™ developed by 1999-2000. The Virtual High School does offer seven AP courses, for which Pape says it will be offering additional sections.

Affiliating schools pay $5,000 in their setup year, for training of one teacher and a site coordinator, then pay $6,000 a year for enrollment of 20 students while providing one online course for the VHS system in subsequent years. The continuing membership fee was introduced as a sustainability measure, and represents $300 per student enrolled, equivalent to the tuition charged by the statewide virtual high schools in Florida (for out of state students; in-state free) and in Kentucky (in-state only, no out-of-state access). Pape believes the administration, quality control, and teacher-training skills they have built are valuable benefits for participants that will help continue VHS growth. The largest numbers of affiliated districts can be found in Georgia, Massachusetts, North Carolina, and Ohio. VHS has state-level agreements to be a virtual high school provider with Departments of Education in Georgia and Ohio, and is expecting a number of district-level affiliations in Michigan.

The Virtual High School has contracted with SRI International for annual external evaluations. Formative evaluation has led to the institution of a variety of quality controls that are instructive for anyone starting a virtual high school. Pape encourages the wide use of VHS administrative agreements and planning and evaluation structures, which are posted to the Web through their site. Another virtual school that has moved to a multi-state collaborative model is CyberSchool of the Eugene Oregon Public Schools, one of the virtual high school pioneers. Following an enrollment decline pending an accreditation approval, it is rebuilding through affiliations with school districts in five states.

The University of Nebraska Independent Study High School Online Diploma Program and CLASS.com. The University of Nebraska-Lincoln operates a large Independent Study High School, established in 1929 that had about 15,000 enrollments by 6500 different high school students in 1999-2000. Through a five-year, $15 million federal Star Schools grant and additional funding from the U.S. General Services Administration, the University's Department of Distance Education has led development of custom software and used it to develop 34 web-based high school courses so far, as part of a complete online high school curriculum. Tuition is $275 per course per semester. The proprietary software features streaming audio and video and interactive features, and is comparable in quality to commercial products. "The one thing we hoped would

change is the bandwidth problem, " says James Schiefelbein, Assistant Director in the Department of Distance Education (Schiefelbein, 2000).

In July 1999, a for-profit company, CLASS.com, Inc., was created to market the University of Nebraska courses. It has a licensing agreement with the University, and in turn creates licensing agreements with other parties. Its most high-profile client to date is the Kentucky Virtual High School (see the KVHS profile for details). Other major universities with established Independent Study High Schools are also creating online diploma programs, including the University of Missouri, University of Indiana, and University of Texas. Brigham Young University is one of the largest private university providers of online high school study. In North Dakota, an online diploma program is being created through the Independent Study Division of the state department of education.

Apex Learning. This for-profit company is a key player in a many state efforts to achieve curriculum equity (see extensive citations in Key Drivers, pages 16-21). It appears likely to become the "standard" for Advanced Placement (AP) courses online, working with College Board.

Other virtual schools serve particular audiences or have unique aspects to their delivery approaches. For example, Mindquest is an online diploma program for adults and young adults who have left school, administered by the Bloomington, Minnesota Public Schools. The Internet Academy, operated by the Federal Way, Washington public schools, serves primarily home school students. The private Babbage Net school emphasizes the use of synchronous online techniques, where most other virtual schools rely heavily on asynchronous communication. ZipStar Academy, a very small private school, uses a community center-based approach to provide online courses to at-risk populations. Several charter schools have begun online components, such as Basehor-Linwood Virtual Charter School in Kansas.

Details about many different kinds of virtual schools can be found in a special online resource compiled by Kathy Lawhon of the Center for the Application of Information Technologies. A printout of this resource is appended to this report.

Key Drivers

Key forces driving state interest in virtual high schools include federal, state and local roles and initiatives, equitable access, and advanced placement.

Federal, State and Local Roles

The federal role in K-12 education has remained fairly consistent in the last two decades, being concerned with research, development, dissemination, coordination, advocacy and legislation (Clark and Else, 1998). The federal government can influence, but not control state policy through its funding and mandates. A key federal focus in recent years has been supporting technology access and integration, in support of systemic educational reform, through programs offered by several federal agencies. Programs of the U.S. Department of Education (USDE) offering direct grants and the year they began, include Star Schools (1988), Goals 2000 (1994), Technology Innovation Challenge Fund (1996), and Preparing Tomorrow's Teachers(1999). Direct USDE support for virtual schools has usually been provided in this context of these programs.

One key example of the new federal interest in online learning is the Web-Based Education Commission (WBEC) authorized by Title VIII, Part J of the Higher Education Act Amendments of 1998, and established by the Secretary of Education on January 26, 1999. The commission first met in November 1999, and will issue its report to the President and Congress by November 2000. The 1998 enabling legislation inexplicably directed the Commission to "conduct a thorough study to assess the educational software available in retail markets for secondary and postsecondary students who choose to use such software." However, the Secretary of Education provided additional direction to the Commission in 1999, stating that it was required to "conduct a thorough study to assess the critical pedagogical and policy issues affecting the creation and use of web-based and other technology-mediated content and learning strategies to transform and improve teaching and achievement at the K-12 and postsecondary education levels." The home page of the Commission (www.ed.gov/offices/AC/WBEC) states that the Commission's mission is "to ensure that all learners have full and equal access to the capabilities of the World Wide Web, and to ensure that online content and learning strategies are affordable and meet the highest standards of educational quality."

State roles in K-12 education typically involve issues such as accountability, certification, equity, funding, and quality. With the explosion of technology-based distance learning opportunities in the 1980s, a number of additional state agencies beyond state departments of education often became involved in policy and control. This is reflected in the diversity of approaches to virtual high school structures discussed in this report. Many states have sought to address equity and access concerns through technology-based education. The states are extremely variable in the degree of funding and leadership they provide for technology. Most offer federal pass-through funding through programs such as the Technology Literacy Challenge Grant and Goals 2000. Some states use regional education agencies and technology offices to assist local districts in technology integration.

District-level roles in K-12 education usually involve administrative direction, facility and strategic planning, and instruction delivery, guidance and support. Based on local circumstances or state

mandates, many districts or have begun to use distance learning technologies on their own, often creating small regional videoconferencing networks. Subsequent efforts to create statewide systems have often faced challenges in integrating existing regional technologies. Because of their role in providing instructional guidance and policy in schools, school districts play an important role in determining the success of virtual high school efforts. "The power is with [school guidance] counselors," says Jack Turner, Principal of CyberSchool. “If they are nervous about the credibility of the school offering, they will wave kids away from it" (Turner, 2000). Districts often must invest considerable resources, such as course fees, technology access and staff time, into virtual high school efforts, but the implications of these investments may not always be closely considered by Governors as they announce statewide virtual school efforts.

Accreditation and Certification

Accreditation and certification are key issues that reside mainly at the state level. Regional accreditation agencies usually house their staff for each state in the state education agency, and work closely with program approval, teacher certification and other SEA staff. All states require virtual teacher certification in their own state, or cross-agreements when teachers are certified in other states, that have the same effect. Without both regional accreditation and state approval, a virtual high school housed in a particular state may have difficulty attracting students at the district level. Accreditation through one of the multi-state accrediting agencies, such as the North Central Association of Colleges and Schools, allows a distance learning program to offer an accredited high school diploma that will be accepted by most colleges and universities The University of Nebraska was the first to achieve such accreditation for a high school diploma, in 1978, and was the first university-based program to begin work on an online diploma program in 1997. After receiving regional accreditation in spring 1999, both the University of Missouri (http://indepstudy.ext.missouri.edu/MUHighSchool/Hshome.htm) and Indiana University (www.indiana.edu/~iuhs) announced similar ventures later in the year (Carr, 1999).

Approval by the state board of education is another hurdle for virtual high schools. Indiana University's virtual high school program is part of an independent study program accredited by the North Central Association. However, public high schools must offer physical education classes, require school attendance 180 days a year, and administer the state's qualifying exit examination to seniors to win approval from the state's Department of Education. The independent study high school, which offers mainly correspondence study and out-of-school online study for out-of-state students, cannot comply with these requirements, and therefore cannot win state approval under current laws (Carr, 1999). Because meeting equity and access goals for home state students is not the key focus of university-based independent study programs, which are self-funded through mainly out-of-state tuition, public education officials may see university-based programs as competition, rather than as allies in meeting state educational needs. As Steven Hess, Executive Director of the Utah Education Network, recently noted, local schools "live and die on that weighted pupil unit and wouldn't want to lose that to any outside vendor" (Toomer-Cook, 2000).

Demographic Factors

States face different kinds of demographic pressures in planning for future K-12 system capacities. Overall, the number of public and private high school graduates is expected to increase by 20 percent between 1997 and 2008 (Gerald and Hussar, 1998). Of the states now operating or known

to be planning virtual high schools, only one (Florida) is predicted to have enrollment increases significantly higher than the national average between 1997 and 2008 (see Table 1). In other words, meeting new capacity demands may not be as important a factor as some have portrayed it to be.

Table 1. Expected changes in number of high school graduates, 1995-96 through 2007-08

States Operating or Planning a Virtual High School	**Percent Change in Projected Number of High School Graduates**
Florida	45.2
Illinois	13.9
Kentucky	0.5
Michigan	13.3
New Mexico	22.2
Utah	3.6
National Average	**20.2**

Source: Gerald, D., and Hussar, W. (June 1998). Projection of Education Statistics to 2008. NCES 1998-016.NCES, Common Core of Data Surveys, October 1997.

Equity and Access

Equity and access are probably the most prominent policy issues in technology-based K-12 education.

Equitable access to Internet and computers. In Fall 1999, 77 percent of public secondary schools reported having access to the Internet through a dedicated high-speed connection, and 98 percent reported some kind of Internet connection (Williams, 2000). The percentage of instructional rooms with Internet access in secondary schools has increased dramatically, growing from only 16 percent in Fall 1996 to 67 percent in Fall 1999. The ratio of secondary students to instructional computers with Internet access has decreased sharply, falling from 10 to 1 in Fall 1998 to 7 to 1 in Fall 1999. However, effective use of virtual high school resources requires specific multimedia computer capabilities and Internet access speeds that remain acceptable even during heavy use. The percentages of high schools that can provide these capabilities for significant numbers of virtual students is hard to estimate.

High-poverty schools tended to concentrate their Internet access in labs rather than classrooms. In Fall 1999, about 39 percent of instructional rooms had Internet access in high-poverty schools (71 percent or more of students eligible for free or reduced-price lunches), compared with 74 percent classroom access for the lowest-poverty schools (11 percent or less of students eligible) (Williams, 2000). However, this may not be as great a barrier to virtual school participation as it might first appear. For the purpose of taking part in many kinds of virtual courses online during the regular course of instruction, students may need Internet access in laboratory settings. This need for lab access may run counter to "best practices" for technology integration into the classroom, which call for integrating computers into individual classrooms. Many U.S. schools started with a lab-based system of computer access and are working toward a classroom-based system, but few are getting

rid of their labs. Still, group-based online courses taken during the regular school day may be seen as competing for limited computing resources in some schools, both in terms of competition for modern multimedia computers and for computer lab time.

Equitable access to key curricula. Especially in states where affirmative action in college admissions has been eliminated or is in jeopardy, alternative methods of providing equitable access to college opportunities have been propounded by Governors. Key among these is offering Advanced Placement courses, which can both increase high school grade point averages and "jump start" college attendance for at-risk students. It is therefore not surprising that AP has been a driving force in the development of several state-level virtual high schools. Many Governors have made strong commitments to Advanced Placement access in their 1999 and 2000 budgets and "State of the State" messages. For example, Governor Gray Davis called on the California legislature in January 2000 to provide funds to make at least one AP course available to every high school student in fall 2000, and at least 4 courses by Fall 2001. Texas Governor George W. Bush set a goal of 10,000 exams passed by Texas students by 2002, following up on a $19 million package for universal AP access passed by the legislature in 1999. Michigan Governor John Engler charged the Michigan Virtual University with creating an online Advanced Placement Academy as part of a $15 million virtual high school initiative. Recognizing the state-level consensus for action, U.S. Secretary of Education Richard Riley got into the act in February 2000, calling on every U.S. high school to offer at least one AP course within two years, with the goal of adding a course a year for the next ten years (Riley, 2000). Nationally, about 56 percent of high schools offered AP courses in May 1999 (College Board, 1999). In many of the states that have current or planned statewide virtual high schools, AP equity concerns are high, although as a group they offered AP courses in a higher percentage of schools than the national average (see Table 2).

Table 2. High Schools Offering AP in Selected Virtual High School States, May 1998 and 1999

Selected States Implementing Virtual High Schools	**% of All High Schools, Public and Private, in AP Program, May 1998**	**% of High Schools, Public and Private, in AP Program, May 1999**
Florida	57.5	62.7
Illinois	51.8	52.0
Kentucky	60.0	64.8
Michigan	54.1	56.5
New Mexico	43.9	48.4
Utah	71.6	69.4
Average, 6 virtual high school states	**56.5**	**59.0**
Average, all 50 states	**53.8**	**56.0**

Source: College Board (1999). Percent of Schools in AP. Based on statistics provided by Quality Education Data, 1999.

Advanced Placement. Initiatives funded through the Ford Foundation led to the establishment of the Advanced Placement program of the College Board in 1955. AP allows students to take college-level courses while in high school, taught by high school teachers. Upon completing an AP course, students can take one or more exams administered by the College Board for that content area. If they pass the exam with a score of 3 or better, 11th and 12th graders can typically receive

credit upon college admission. Many universities add a point to AP scores when calculating grade point averages. For example, an "A" on an AP exam counts as a "5", not a "4", in the University of California and California State University systems. Therefore, those students whose schools provide greater access to AP courses have an advantage in college admissions. While only about one third of students in a typical AP course take AP exams, by1999 about 1.1 million AP exams were being administered annually (College Board Online, 2000).

Through the Advanced Placement Incentive Program (APIP), the U.S. Department of Education offers assistance to state education agencies in making AP exams available to low-income individuals for no more than a nominal fees. APIP includes other measures to increase AP enrollment, exam taking, and course availability for low-income students. Funding for this program increased from $4 million in FY 1999 to $15 million in FY 2000, with a requested increase to $20 million in the FY 2001 President's budget. In 1999 and again in 2000, allowable activities under APIP included "projects that provide student access to advanced placement courses online." In 1999, Michigan Virtual University provided tuition for enrollments by 100 low-income students in Apex online AP courses through the program, the first K-12 offerings brokered by MVU. The APIP program announcement in February 2000 directs the bulk of FY 2000 program money toward the priority of increasing course availability, through online and other methods.

As remedies to historical inequities such as affirmative action and desegregation have waned in public support, equal rights advocates have made equitable access to school curricula a new rallying point (Hill, 2000). In Summer 1999, the American Civil Liberties Union filed a lawsuit on behalf of four students at a California high school serving a relatively low-income neighborhood, claiming that the state was denying them equal and adequate access to AP courses. This might be considered a revolution of rising expectations, since the state ranked 8th nationally in AP offering schools in 1999 (72 percent), and the school attended by the students bringing the lawsuit itself offered three AP courses - while a school in a wealthier neighborhood across town offered 12.

The lawsuit led to a new infusion of state funding for the AP side of the UC College Prep (UCCP) initiative, which began in Fall 1998 as a way of providing online college preparatory courses to supplement and compliment the curricula of schools with limited options (UCCP, 1999). Francisco Hernandez, Vice President for Student Affairs at the University of California at Santa Cruz, who led the initial effort to create the UCCP, says "the Governor was setting very high expectations and putting dollars behind it" (Hernandez, 2000). Hernandez was concerned that virtual school efforts were often started without a focus on diversity issues. "I decided that if it was going to approach diversity, then it had to be by design, and it had to be from the beginning. What I didn't want was a virtual school, then a study of minority participation." This "diversity by design" began with a study to identify California high schools that did not offer AP, honors or other courses needed for University of California admission. The University sought to build on existing partnerships with some of these schools in pilot testing prototypes for online learning that supported the UCCP mission. Hernandez does not characterize California's UCCP as a virtual school, although an extensive virtual high school feasibility study preceded it (http://vhs.ucsc.edu/vhs). The initiative is focused on the goal of providing access to AP and advanced coursework needed for college preparation, rather than focusing on the methods used to achieve this objective. UCCP works with the community college and California State University systems collaboratively, to meet these advanced coursework needs by a variety of methods, including electronic supplemental materials

for regular AP courses, and training for AP teachers. For the Florida High School, a similar study of access to AP courses and interest in other offerings was conducted in 1997, through a statewide survey of school superintendents. The Florida study focused more narrowly on AP availability. As in California, some of the state funding for the Florida High School in the FY 2001 budget will be targeted toward AP, based in part on a strong interest from the Governor's office. While not AP-specific, the Florida High School's criteria for student enrollment give first preference to students in low-performing and rural schools that often lack AP and other advanced coursework options.

Commercial AP providers. For-profit organizations are moving quickly to tap into the new Advance Placement market online. Many distance learning and virtual school organizations, including the for-profit CLASS.com, offer locally developed Advanced Placement courses as part of their overall curriculum "mix". However, none focus exclusively on delivering Advanced Placement courses and associated offerings. Filling this market niche has been the goal of APEX Learning, founded in 1997 by Paul Allen, a Microsoft co-founder. The company offers AP courses specifically aligned to AP standards in six subject areas (Calculus AB, Statistics, U.S Government, Politics, Microeconomics, and Macroeconomics), as well as AP exam prep and is planning to introduce supplemental materials and programming for AP teachers in 2000. Apex says that each course "is designed by expert AP teachers and includes self-paced tutorials, multi-media simulations, online discussions, readings and assignments" (see www.apexlearning.com). Apex recently formed a partnership with Edison Schools, Inc. to offer its online courses and teacher professional development in schools managed by Edison. They also will market their AP exam-review materials through Kaplan Educational Centers (Trotter, 2000). States such as California and Michigan are already marketing Apex courses to districts through their statewide online learning initiatives.

The movement of for-profits into online Advanced Placement can be seen as part of the rapid expansion of online companies into the college preparation and admissions industry (Wilgoren, 1999). In July 1999 the former Governor of West Virginia, Gaston Caperton, became President of the College Board. He soon announced a new for-profit subsidiary (see www.collegeboard.com) that will offer an array of services online, fighting for market share within the burgeoning online industry already being explored by competitors such as Kaplan (www.kaplan.com) and Princeton Review (www.review.com). College Board Online offers supplemental materials from previous exams, AP preparation materials, and an online practice essay evaluation service. While still using live readers to evaluate essays, it is also testing the "e-rater" program for automated scoring of English and History essays. It can be expected that the College Board's new National Action Plan for AP, announced in February 2000, will include the introduction of online courses, perhaps in for-profit competition with Apex. However, the two organizations have worked together fairly extensively. In Michigan, College Board helped bring Apex and the Michigan Virtual University together. An interesting twist on the story, that illustrates the issues created when a long-time objective overseer of examinations enters the commercial marketplace, is the College Board's interest in setting standards for courses that use its trademark "AP" or "Advanced Placement." "We don't think we have anything to fear from the imposition of [College Board] standards," says Bryan Barnett, Chief Academic Officer, APEX Online Learning (Barnett, 2000). "We would probably benefit, because it would provide a standard that customers could use to compare us with other providers." However, less well-prepared competitors may be shaken out of the cross-state markets for virtual AP courses.

Analysis of Characteristics, Statewide Virtual High Schools

Some key characteristics of "statewide" virtual high schools were analyzed. Findings of this analysis are summarized below, according to nine aspects of virtual high school organization: technology; funding; curriculum; student services; professional development; access and equity; assessment; policy and administration; and marketing and public relations.

"Statewide" Virtual High School (SVHS) Characteristics: Summary	
Technology	Experimentation is underway in SVHS systems with several major web-based learning platforms. Unique state issues related to enrollment capacities sought, in-house technical resources, partnerships, likely teacher and user characteristics, etc. are factors in the choice of development and delivery software. Some seek to provide "one-stop" access to courses offered by a variety of technologies within a statewide educational technology system.
Funding	Most states are combining funding through a state agency with tuition. Barter models are seeking annual fees from affiliated districts, which have a local impact similar to tuition. Alternative funding structures are not readily apparent. Sustainability strategies are a key concern for many systems.
Curriculum	Curricula offered by SVHS are mainly supplemental to regular instruction, but most will offer alternative diploma options eventually. Wide range of courses available, most not aligned to state or College Board standards. Market demands induce "mission creep" in who is served and why.
Student Services	Student services are handled quite differently in different states. Some place almost all responsibilities on districts, while others have a centralized approach. Some offer virtual library access, online counseling, other virtual services while others arrange in-person services.
Professional Development	Leading schools are taking different approaches, ranging from extensive online training to extensive in-person training, using both in-house and vendor capabilities. No single clear model has emerged.
Access/Equity	Concerns about equitable access to public education are important drivers in most SVHS states. Several have developed policies to encourage SVHS participation by at-risk and rural students.
Assessment	Two largest stand-alone virtual high schools have extensive internal and external assessment structures.
Policy and Administration	Clear agreements and commitments between the various parties involved in administrative services are apparent in most successful models. Some excellent policy examples are freely available from leading models.
Marketing and Public Relations	Major models all have fairly sophisticated approaches to marketing their offerings to potential users, and disseminating information to key stakeholders and opinion leaders.

"Statewide" Virtual High School (SVHS) Characteristics

Technology. Experimentation is underway in SVHS systems with several major web-based learning platforms. Florida is currently using Lotus Learning Space and Learning Server, but may transition to Blackboard or another vendor due to plans to double enrollment capacity. Concord

VHS continues to use the Lotus products, seeking alternate solutions to issues of scalability and speed as their system grows. Kentucky has selected eCollege and its eLearning Solutions suite. Utah uses a proprietary software developed by Utah Education Network. The University of Nebraska also developed a proprietary system for its online courses, marketed through its CLASS.com for-profit spinoff. The Illinois Virtual High School is looking closely at Blackboard, like Florida. The Michigan Virtual High School has not decided on platforms, and the technologies are not known for the proposed New Mexico Virtual High School. All three currently existing state-level virtual high schools also use online courses created by out-of state providers, such as those offered by Nebraska's CLASS and Apex Learning. Ease of use for teachers and learners has been a factor in selection. Course development is easier in some systems than in others, a factor where teachers are asked to participate actively in course development. In the long run, states are seeking to lower their costs by developing courses rather than purchasing them. The short-term cost can still be substantial if off-the-shelf development products are used, but few states have the resources to create proprietary tools that are as effective.

In two of the three existing states with state-level virtual high schools, online courses through the virtual school are marketed as one part of a blend of technology-based options for high school credit. In Utah, this convergence is complete, with all delivery methods packaged through the same broker, the Electronic High School, while in Kentucky, the delivery methods are seen as separate but delivered via a common medium, the Kentucky Educational Technology System. A similar approach appears likely in New Mexico. The championing of multiple methods of distance learning is less apparent in the Florida High School and Concord VHS, operated out of public school districts, and in the University of Nebraska virtual high school, built upon an independent study program.

Funding. Most states are combining funding through state appropriations with tuition. Major providers have sought to match tuition costs at about $300 a semester. This is even true of Concord VHS, which plans to begin charging an annual fee of $6,000 to affiliated schools in return for 20 student enrollments. The Utah Electronic School, however, charges only $100 a course for non-residents to take its online courses, while Kentucky courses are marketed only to residents, at a cost of $300 per semester. In all systems, students at eligible schools usually have their tuition paid by the school. However in states with a strong tradition of free services for public education, the charging of substantial tuition to school districts can be a limiting factor in participation. Districts appear more likely to "buy in" if there is a formal affiliation agreement, which the district approaches as a partnership. However, that approach may not be an option in states where universal access to the virtual high school has been promised initially. Michigan Virtual University can expect to leverage significant corporate funding for its virtual high school, due to its existing connections, but other statewide virtual high schools may have difficulty drawing significant business support. While the University of Nebraska has solved the problem of sustainability by developing proprietary software and becoming a major outsourcing provider, this option will not be available to many states, which do not have research and development resources. The Concord VHS is also actively pursuing sustainability, although it has more than a year left of federal funding. However, the advantage of belonging to a collaborative while also paying the equivalent of the tuition state systems charge is problematic. Sustainability strategies need to fit the unique circumstances in which each virtual high school operates.

Curriculum. State-level virtual high schools and other leading models mainly describe their curricula as supplemental to regular instruction. However, most are planning for alternative diploma options that are fully online, to serve alternative education markets. Florida High School has sought to focus online curriculum development on core cores and advanced college preparatory coursework. The Utah Electronic High School has also focused recently on developing a "Utah core," but in its brokering role has provided access to a wide range of online courses from other states, which is found to be of variable quality. The Concord VHS, based on a collaborative or course barter approach, has the widest variety of elective courses. Recognizing the course quality issue inherent in such an approach, it has instituted significant quality measures (see Assessment below). In Kentucky, middle school courses that are high school preparatory appear likely to be added to the mix. Most online courses available today are not aligned to state or national standards.

Student Services. Student services are handled quite differently in different states. Most models share student service responsibilities between virtual high school administrators and the schools or districts through which local students are enrolled. The Florida High School has a full-time counselor available online and via e-mail and telephone to registered students. In the Florida High School and Concord VHS, affiliation agreements place significant responsibilities on the partner districts, which must provide a site coordinator. Generally, states expect local schools to provide computer and Internet access, proctoring, and recognition of credit earned. The independent study high schools, which typically enroll a student "here and there," ask less of local districts. The Kentucky Virtual High School shares resources with the Kentucky Commonwealth Virtual University, including access to the Commonwealth Virtual Library developed as part of the state's virtual university effort.

Professional Development. Leading schools are taking different approaches, ranging from extensive online training to extensive in-person training, using both in-house and vendor capabilities. Concord VHS, which does not have the option of gathering its far-flung teachers together, has created a 26-week online teacher training course. Florida has conducted its teacher training largely through in-person intensive workshop and seminars. Vendors such as CLASS.com, Inc. provide on-site training workshops for in-state teachers who will teach their courses, and eCollege, Lotus and other vendors provide on-site training in course development. The vendors also provide extensive online follow-up training. On-site, virtual and mixed method approaches all appear to be effective.

Access/Equity. Concerns about equitable access to public education are important drivers in many states developing virtual high schools. In several of the states, Governors have supported virtual high schools as a way of providing "curriculum equity" as other remedies such as affirmative action are de-emphasized or phased out, especially focusing on curricula such as Advanced Placement courses. Florida High School provides early enrollment of students in low-performing and rural schools. The multi-state collaborative Concord VHS offers a sliding scale of membership fees to encourage affiliation by low-wealth districts.

Assessment. The two largest stand-alone virtual high schools have extensive internal and external assessment structures. Concord VHS has contracted with SRI International and the Florida High School with Florida State University for external assessment. The Netcourse™ quality standards and evaluation rubrics developed by Concord VHS and SRI are outstanding. Both have embedded

continuous internal needs assessment and evaluation procedures in their online courses and administrative processes with participating districts.

Policy and Administration. Clear agreements and commitments between the various parties involved in administrative services are apparent in most successful models. Concord VHS, and to a lesser extent the Florida High School, have posted their administrative and policy documents to the Web. Their approaches to the roles and responsibilities of the various parties involved in a virtual high school have been developed and refined through substantial experience.

Marketing and Public Relations. Major models all have fairly sophisticated approaches to marketing their offerings to potential users, and disseminating information to key stakeholders and opinion leaders. The Florida High School has been visited by delegations from 30 states, and like the Concord VHS has been the subject of numerous stories by in-state and out-of-state media. The Utah Electronic High School's administrator has the unique position of also serving as a state legislator. The Kentucky Virtual High School will be participating in a major marketing effort to increase enrollment, led by Kentucky's Commonwealth Virtual University.

Recommendations

Based on an analysis of virtual high school characteristics, "lessons learned," and key drivers of virtual high school development, recommendations are made for those planning "statewide" virtual high school systems. These recommendations are briefly summarized below.

Recommendations for SVHS Planning

Technology. *Consider all technology options in relation to likely needs over the next two years, and think strategically and flexibly about technology over time. "One-stop" access to a variety of technologies should be considered to maximize return on the state's educational technology investments.*

Funding. *Consider funding implications early on, including the cost/benefit to local districts for participating, and seek to identify as early as possible the most sustainable funding mechanisms in your state*.

Curriculum. *In deciding on course licensing and course development parameters, consider the main purpose of your curriculum in terms of state specific needs, and the likelihood of future external course sharing*.

Student Services. *Form alliances to provide student services, and involve local districts in decisions about the extent of local responsibilities.*

Professional Development. *Consider a mix of methods for providing teacher training, leveraging existing resources wherever possible, and creating incentives for participation.*

Access/Equity. *Prioritize the access/equity concerns most relevant to your state, and create strategies for reaching at-risk populations and providing AP access*.

Assessment. *Create an internal formative assessment structure, and use external evaluation with reports timed to fit the state legislative cycle*.

Policy and Administration. *Adopt and adapt from existing virtual HS policies and procedures, while seeking to ensure a good fit with unique state circumstances.*

Marketing and Public Relations. *Develop a comprehensive marketing strategy, working collaboratively with partners, including enrollment strategies for users, and public relations strategies for stakeholders, funders and opinion leaders, while working to keep their expectations in line with achievable goals.*

References Cited

Barnett, B. (2000, March 12). E-mail communication.

Blackford, L. B. (1999, October 08). Virtual high school to offer advanced courses statewide. Program thought to be first in nation. *Lexington Herald-Leader*. Available online at: http://www.herald-leader.com

Carr, S. (2000, January 14). Indiana U's virtual high school criticized over accreditation. *Chronicle of Higher Education*. Available online at: http://www.chronicle.com

Chaika, G. (1999, March 1). Virtual high schools: the high schools of the future? *Education World*. Available online at: http://www.education-world.com/a_curr/curr119.shtml

Clark, T., and Else, D. (1998). *Distance learning, electronic networking and school policy*. Fastback No. 441. Bloomington, IN: Phi Delta Kappa Educational Foundation.

College Board. (1999, August 31). *College-bound students*. New York NY: The College Board. Based on statistics provided by Quality Education Data, 1999. Available online at: http://www.collegeboard.org/index_this/press/senior99/html/apschlch.html

Dede, C. (1996). The evolution of distance education. *American Journal of Distance Education, 10* (2), 4-36.

Engler, J. (2000, January 2,). *State of the state address to the legislature*. Available online at: http://www.state.mi.us/MIGOV/gov/Speeches/StateoftheState.shtm

Friend, B. (2000, March 14). Personal interview.

Harrington-Lueker, D. (1997, September). Web high. *Electronic School Magazine*. Available online at: http://www.electronic-school.com/0997f2.html

Hill, D. (2000, March 1). Test case. *Education Week, 19*(25), 34-38.

Fitzpatrick, J. (2000, March 14). Personal interview.

Gerald, D., and Hussar, W. (1998, June). *Projection of education statistics to 2008*. NCES 1998-016. Washington, DC: U. S. Department of Education, National Center for Education Statistics.

Hernandez, F. (2000, March 10). Personal interview with Tom Clark.

Johnston, S., Stark, S. , and Young , J.. (1998, September). The cyberface of tomorrow's schools: the new Florida High School. *NASSP High School Magazine, 6*(1). Online edition. Available online at: http://www.nassp.org

Pape, E. (2000, March 10). Personal interview.

Pittenger, L. (2000, March 10). Personal interview.

Riley, R. (2000, February 11). *Remarks of U.S. Secretary of Education at national forum to expand Advanced Placement opportunities*. Washington, DC: U.S. Dept. of Education. Available online at: http://www.ed.gov/Speeches/02-2000/20000211.html

Sappenfield, M. (1999, August 3). School equity fight gets 'smarter.' *Christian Science Monitor*, p. 1, Section 1.

Schiefelbein, J. (2000, March 13). Personal interview.

Siddoway, R. (2000, March 8). Email communication, and personal interview conducted by Kathy Lawhon of Western Illinois University.

Toomer-Cook, J. (2000, January 22). Scrambling to keep up with enrollment. *Deseret News*, online edition. Available online at: http://www.desnews.com/misc/growth/jan22.htm

Trotter, A. (2000, February 16). New company hopes to score big with online advanced placement courses. *Education Week, 19*(23), 13.

Turner, J. (March 13, 2000). Personal interview.

University Continuing Education Association. (1997). *Program profiles, 1995-96*. UCEA Division of Independent Studies. Washington, DC: UCEA.

Verduin, J.R., and Clark, T. A. (1991). *Distance education: the foundations of effective practice*. San Franscisco: Jossey-Bass Higher and Adult Education Series.

Wilgoren, J. (1999, September 25). Aged upstart, College Board, is joining gold rush on Web. *New York Times.* [Online free subscription edition]. Available online at: http://www.nytimes.com

Williams, C. (2000, February). *Internet access in U.S. public schools and classrooms*. Stats in Brief. NCES 2000-086. Washington, DC: U. S. Department of Education, National Center for Education Statistics.

Young, J. (2000, March 14). Personal interview.