IDENTIFCATION OF KEY CRITERIA IN

VIRTUAL EDUCATION PROGRAMS GRADES 9-12

by

LISA MICHELLE STUEVE

(Under the Direction of C. Thomas Holmes)

Currently, there are no generally recognized standards, guidelines, policies, or procedures in place for the development, growth, or maintenance of online education programs. The identification of key components of distance education as it relates to web-based course delivery for students in Grades 9-12 are considered. The research was centered on three areas of concern: policy, people, and technology. The research questions were directed to the future of teaching and learning in virtual classrooms. The researcher developed a survey instrument which was sent to 57 panelists consisting of virtual high school administrators, eCourseware providers, and educators. Three research questions were investigated using a modified Delphi approach. Definitions and examples were provided to assist in the process of brainstorming ideas in order to generate a specific list of the key components to online education for students in grades 9-12. Second, all criteria solicited through the initial instrument were reviewed and ranked as 1 (critical), 2 (indispensable), 3 (expendable) or 4 (unnecessary). Finally, criteria were reported in rank order and a request to order, modify, and/or add to the initial response based upon their review of other members ideas was made. The data gathered by this survey instrument became the basis for the key criteria in virtual education programs Grades 9–12. The resulting list of criteria based on the established rank from the panelists included 50 key items considered by

panelists to be necessary to establish and maintain a virtual program in Grades 9-12. The survey results validated the absence of standards, guidelines, policies, and procedures and assisted in pointing the direction in which these could possibly be established. Future studies should include existing local guidelines and practices. It is recommended that facilities be addressed as an entirely unique topic in order to capture data that includes the impact on the physical structures, technology hardware, as well as student and instructor access to facilities. When replicating this study there is a need to encourage a discussion of impact for facilities. It is also suggested that the criteria category of policy be subdivided in a future study to include legislative policy, that is, state and federal rules and guidelines that are requirements for entities within their boundaries, as a separate category than that of local school program policies and procedures.

INDEX WORDS: Virtual School, Distance Education, Internet, Web, eLearning

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DEDICATION

The study presented in this manuscript is dedicated to my daughter, Madison Jewel Stueve, without whom there would have been no beacon. So, to her and to my Creator, I dedicate this work.

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CHAPTER 1

THE PROBLEM

Overview

Interest in the advancements in distance education is evidenced by the growth in participation in web-based course delivery at the postsecondary and secondary levels. In addition, legislative policies governing funding for distance education, virtual charter schools, and federal time equivalencies continue to be crafted in a manner that facilitate the growth of this education medium. Additionally, the advances in emergent technologies continue to change the face of computer-based instruction. “We are in the midst of a revolution that will profoundly alter how we learn, work and communicate, and conversations emerge about philosophical considerations inherent in the use of these technologies” (Watts, 2003a, p. 5). Teaching and learning are impacted in method, style, and practice. Technological advancements translate into change for the culture of education. “Any major change in that culture is going to force a change in educational philosophy, and consequently, practice” (Watts, 2003b, p. 97).

> In order to address the future of distance learning, one must first consider its past.
>
> > Ever since Thomas Edison predicted that motion pictures would replace textbooks for learning in 1922, the use of video was popular in training. Especially, in World War II, the U.S. Army used video tapes to train employees. Shortly after WWII, video technology and television were used for training and demonstration. (Shih et al., 2003, p. 1)

The pace of technological advances and their application to distance education has increased exponentially since 1922. Congress addressed distance learning for the first time when

reauthorizing the Higher Education Act in 1992. "By the time Congress next reauthorized the Higher Education Act in 1998, distance education had evolved from the educational sideline of a few institutions into a mainstream method of delivery for many" (Salomon, 2004, ¶ 2). The focus on distance education remained largely postsecondary until the late 1990s. The growth of distance learning has certainly continued apace. According to the latest DOE statistics, during the 2001-2002 academic year, 56 percent (2,340) of all Title IV eligible colleges and universities were offering instruction through distance education technologies (Salomon, 2004). Currently, there is a wide range of web-based opportunities available to enroll in both high school and college courses, to earn continuing education and training credits, or to complete professional certifications in a variety of skill areas (Donlevy, 2003).

From the policy perspective, the evaluation criteria of distance learning programs affect the instructional quality and performance of students which has an influence on how the industry trusts distance education. The professionals needing to create a high quality distance learning courseware include educational professionals, engineers, art designers, and other experts working together (Donlevy, 2003). The students who are successful in virtual learning environments are technology savvy and understand that technology is only a tool to be used by people. With the new millennium and beyond, computer and communication technologies will be integrated with content. New technologies will need to be further investigated; for example, real-time protocols, broadband and wireless communication technologies, multimedia streaming algorithms, intelligent tutoring, visual computing, and new learning models. The fundamental elements of distance learning are: “policy, people, and technology” (Shih et al., 2003, p. 2).

Statement of the Problem

Currently, there are no generally recognized standards, guidelines, policies, or procedures in place for the development, growth, or maintenance of online education programs.

Purpose of the Study

The purpose of this study was to identify key components of distance education as it relates to web-based course delivery for students in Grades 9-12. The research was centered on three areas of concern: policy, people, and technology. The research questions were directed to the future of teaching and learning in virtual classrooms.

Three research questions were investigated using a modified Delphi technique:

1. What are the key components in policy, people and technology in online education for students in grades 9-12?
2. What should be the order or priority for the key components identified?
3. Given the rank order would you recommend any changes in rank, modifications to the criteria definitions, and/or add to the list of criteria?

Definitions and examples were provided to assist in the process of brainstorming ideas in order to generate a list of the key components to distance education, specifically the key components to online education for students in grades 9-12. Second, all criteria solicited through the initial instrument were reviewed and ranked as 1 (critical), 2 (indispensable), 3 (expendable) or 4 (unnecessary). Finally, criteria were reported in rank order and a request to order, modify, and/or add to the initial response based upon their review of other members ideas was made.

Justification of the Study

As students increasingly go online to “communicate with experts, politicians, scientists, business people, or teachers in other parts of the country or world, they have access to millions

of documents, databases, libraries, museums and other resources" (Zucker, Kozma, Yarnall, Marder & Associates, 2003, p. 6). Other issues of distance education will need researchers, engineers, and participants to work together (Shih et al., 2003). While we await the coming reauthorization of the Higher Education Act, colleges, universities, consortia, and for-profit institutions are looking to Capitol Hill for the kind of change that will make a real difference to a great many students both in the United States and globally. The real question now is *how*—and *whether*—it will be a significant improvement over the current legal and regulatory framework (Salomon, 2004, ¶ 8). The conversation is alive in the field of education, but, too often, it is centered on technology being a quick fix for the ills of the educational system. Academics often turn toward technology for renewal and "the role that new technology should play in our schools . . . is something that needs to be discussed" (Watts, 2003a, p. 5). Included in these discussions are eLearning criteria for Grades 9-12. Thomas (2002) stated that:

> According to estimates, more than 50,000 K-12 students nationwide were enrolled in online courses during the 2001-2002 school year. More than half the states have forms of state virtual schools that promote and support the use of web-based courses by schools and students. At the same time, charter schools across the country offer web-based courses for K-12 students. (¶ 1)

The number of K-12 students, predominantly Grades 9-12, continue to increase rapidly. Florida's virtual high school reportedly served 17,858 students in 2003 to 2004 (SREB, 2004, p. 8). This research determines specific criteria to help develop, maintain, or grow an online education program for students in Grades 9-12, addressing a small portion of the technology conversations in the field of education.

Design of the Study

The series of questions, which is a modification of the Delphi technique, consisted of three surveys that were presented to a panel of experts in the field of online education in order to

gather comprehensive information. The purpose of this process was to identify key components in the future of eLearning programs in Grades 9-12. Data gathering occurred via email.

An initial questionnaire was sent to 74 panelists to solicit input on key components in the three predetermined areas of policy, people, and technology. Panelists were removed from the request after determining that contact information was no longer valid. Subsequent surveys were sent to the remaining 57 panelists. These questionnaires were required to be returned to the researcher. A participation rate of 25 percent or higher was considered acceptable for continuation of the study.

A second survey instrument was derived from this information. The second survey consisted of all criteria listed by panelists, which was then re-sent to all panelists. Panelists who participated in the first round and those who did not were asked to continue in the second survey. Panelists were asked to rank the criteria along a continuum of importance. A participation rate of 25 percent or higher was considered acceptable for continuation. A third, and final, instrument was created and re-submitted to all 57 panelists, who were then asked to order, modify, and/or add to the initial responses based upon their review of other members' ideas.

These data were collected and reviewed by the researcher. A final report was prepared and distributed to the panel members continuing to participate in the study.

Panelists (see Appendix A) were selected and invited to participate in this study based on their considerable knowledge and expertise in the field of online education. Panelist participants were solicited from professional organizations on the edge of the virtual high school evolution. These organizations included but were not limited to NACOL, CiTE and eClassroom. Additionally, the majority of the experts were administrators, courseware providers, or support

for existing virtual high school projects in the United States and Canada, including many purveyors of information to the industry.

Limitations of the Study

The parameters of this study indicated the following limitations: The research did not consider federal and state policy concerning funding for K-12 virtual programs. In addition, selection of the participants in the study was determined by association to organizations including but not limited to NACOL, CITE and eClassroom. The body of participants did not include parents, community members, or legislators. Additionally, participants were encouraged to participate throughout the course of the study. However, there was no specific method to guarantee the continued participation of any individual expert.

Organization of the Study

Chapter 1 introduced the investigation of the problem, presenting an overview of the study; a statement of the problem including research questions addressed by the study; justification for the study from the national, state, and local perspectives; the design of the study; and its limitations.

Chapter 2 offers a review of literature related to virtual education programs, distance learning, perceptions of educators of eLearning environments, and a review of the research surrounding K-12 eLearning programs.

Chapter 3 presents the design of the research. The design includes methodology: instrumentation and procedures; subjects: location, population, and sample; and findings: data analysis and implications.

Chapter 4 reports the findings and analysis of findings. Findings include statistical and narrative data collected. Analysis of findings utilizes the modified Delphi technique.

Chapter 5 provides the conclusions and recommendations for further research. Conclusions are based upon reported information and the data analysis. Recommendations are formulated to provide educators and researchers with suggestions for future applications of the instrument used in the present investigation, including its limitations that might be eliminated or modified to expand the utilization of the instrument.

CHAPTER 2

REVIEW OF THE LITERATURE

This chapter has been divided into three sections. The subject of this research is the identification of key criteria in virtual education programs Grades 9–12. The criteria have been divided into three sub-categories: people, policy, and technology. Each of these elements is addressed in the review.

Introduction

Part I of the review of the literature is a brief overview of the history of the school system and curriculum delivery methods. This section is included to set the background and provide the framework for the remainder of the chapter.

History of the School System

"From the landing at Plymouth Rock to today, educators and community members have debated over the best way to educate citizens" (PBS—Roundtable, 2001). Horace Mann, reputed as being "the Father of American Education" because of his effort in bringing about changes in the process of educating Americans, worked through state and federal policy to affect change during the early eighteen hundreds. Mann had a keen interest in school policy, and, "of the many causes dear to Mann's heart, none was closer than the education of the people" (Cremin, 1957, p. 6). Mann's milestones included presiding "over the establishment of the first public normal school in the United States at Lexington in 1839" (Filler, 1965, p. 15) as well as "reinvigorating the 1827 law establishing high schools" (Filler, p. 15). However, the debate over the best way to educate students continued. In the early 1900s, John Dewey, considered to be one of the most influential thinkers on education during the 20th century, introduced additional variables to be

considered in the process of educating students. “In Experience and Education (1938), Dewey argued that education should be based on the child’s psychological and physical development, as well as the world outside the schoolroom.” (as cited in PBS Roundtable, 2001). Dewey has been associated with child-centered education, but his methodology cannot easily be identified using a single curriculum delivery model. The idea of educational reform, while not new, began to increase in pace in both policy and process.

> The relevance of Dewey’s ideas to industrial and urban growth made his theories prominent in his lifetime, and the recurring notions of child-centered learning formed the basis of progressive education, enjoying continued popularity today. These reform initiatives have lofty goals of increasing access, raising standards of quality, spawning innovation and empowering students. (PBS Roundtable, 2001)

*Curriculum Delivery Method*s

Beginning in the 19th century, American classrooms were Spartan. There were no colorful, research-based, or education-related decorations, and the simple schools often served as town halls and churches for the communities they served. As with the progress of school reform, change was a certainty for education in America. The 21st century American school would be unrecognizable to educators from the one-room school houses of the 19th century. Schools are managed by large systems of government, and teachers are expected to possess and maintain college degrees. Students are separated by grade and often by ability and the classrooms are overflowing with resources; books, maps, and electronic equipment (PBS Roundtable, 2001). Delivery of curriculum is a fluid and dynamic process. Individualized expectations for instruction are becoming a part of the student as consumer of the education process. “Over the last two hundred years, the common school and its one-size-fits-all curriculum have evolved into a larger union school with wide course offerings” (PBS Roundtable, 2001). In addition to the certainty of change, the rate of change has increased progressively. “During the late 1800s the

trend toward developing curricula was geared toward providing opportunities for the growing middle classes" (Levenburg, 2002, ¶8).

Trends in curriculum during the balance of the 20th century included increased specialization and choice of electives. Student rebellion during the 1960s resulted in new courses and new forms of content delivery. The assessment movement of the 1970s was based on a desire to bring institutions to greater levels of accountability through focusing on students' abilities rather than their qualities. The pace of change in courses demanded by students being delivered by educators and curriculum methodology, continued to increase (Levenburg, 2002).

The rapid pace of change in curriculum delivery continued into the late 20th century, and progresses more so into the early 21st century. It is believed by some that curriculum preserves and transmits values and culture while others have debated the issue of whether curriculum, more appropriately, mirrors or influences society (Levenburg, 2002). Advances in curriculum reform continue to develop.

> In 1993, the Massachusetts Education Reform Act had a dramatic effect on the content and delivery of education in the state. A rigid common curriculum and corresponding tests called MCAS (Massachusetts Comprehensive Assessment System) were implemented with the goal of providing consistent content and an assessment system for the whole state. (PBS Roundtable, 2001)

Included in the change is the method of delivery. Gone is the one-room school house with students of all ages and abilities, the sole teacher with basic resources that included slate, chalk, and a few books. The 21st century embraces a classroom environment made rich by resources. The inclusion of these resources in the delivery of curriculum impacts the traditional as well as distance education.

Distance Education

Distance education has its roots in correspondence courses. “In 1883, the first correspondence program in the United States gained academic respectability through recognition by the State of New York, as a valid educational program” (Greenburg, 2002, p. 2). Correspondence education was used to train workers in various industrial vocations including miners and iron workers. Influenced by new technologies, correspondence courses began to include videos in the early 20th century. Video technology and television began to be used shortly after World War II, as Edison had predicted. The advancement in telecommunications impacted the progress of distance education through content, curriculum delivery, and pedagogy and these advances continued to progress. “Telecommunications empower students to cull information from around the world directly into their classrooms. Students can participate in classes led by teachers in other states” (PBS—Roundtable, 2001). The ability to share students and instructors is increased exponentially from telecommunications to the Internet and eLearning or virtual programs and courses. The progression of distance learning includes written correspondence, telegraph, telephone, radio, audio, video, and, of course, the Internet. Virtual programs are a direct reference to using the web to communicate, but education from a distance is nothing new.

Correspondence education developed in the mid-19th century in Great Britain, France, Germany, and the United States, and spread rapidly throughout the world. Many educators consider correspondence education the precursor of distance education, which is instruction that uses different communication technologies.

Communication technologies include the Internet, telephone, radio, and/or television. Efficiency, cost, technological advances, and the type of instruction are all considerations when

investigating distance learning technologies. The strides in both efficiency and cost in the Internet as a communication medium over the last 20 years has caused its use to outpace that of any other method. Beginning with radio broadcasts in the 1930s through the introduction of educational broadcasts by television as early as the 1950s, technology advances continue to be applied to the area of education, specifically, distance education. Early efforts at the use of television in education bear little resemblance to the sophisticated telecommunications courses offered in classrooms in the 21st century. Teleconferencing is person-to-person and is married to some other form of communication to share academic content. Videoconferencing was introduced in the 1980s and was and is still limited by its enormous cost, with systems beginning at around $250,000 for just initial installation.

> Web conferencing, a child of early proprietary audiograhics products began to be introduced in the early 90's. The web conferencing space started gaining traction in the late 90's w/ Placeware, Web-Ex, Raindance, etc. According to Wainhouse Researcher Marc Beattie, ConferTech & AT&T were the first two significant providers in what is now the current market - started in 1980's - there were services prior to that where operators could create multi-party calls. (Greenburg, 2002, p. 2)

Technology has continued to advance, and distance education has now moved into a web-based delivery format. Some institutions have strictly web-based course offerings, while many others offer hybrid courses—courses that meet periodically face-to-face. “Many successful distance learning programs include on-campus and other face-to-face components, which provide a social context for individualized learning, help keep motivation levels high and raise course completion rates” (Baer, 2000, p. 459).

Policy

Federal Policy

The beginning of distance education as with so many other technological advances can be traced back to a United States military initiative. After reported military success with various distance education tools, postsecondary institutions began to transfer this teaching methodology into the classroom.

> 1998 Amendments to the Higher Education Act of 1965 included under Title IV Student Assistance, Part G general provisions Section 488 Distance Education Demonstration Programs. This provision allowed programs that are strictly monitored by the department of education to test the quality and viability of expanded distance education programs currently restricted under this Act. It also provided for increased student access to higher education through distance education programs and was to determine the most effective means of delivering quality education via distance education course offerings, the specific statutory and regulatory requirements which should be altered to provide greater access to high quality distance education programs and the appropriate level of Federal assistance for students enrolled in distance education programs. (U.S. Dept. of Education, 1998, SEC. 488 ¶2)

In addition, as an amendment to the Higher Education Act in 1998 under Title VIII Studies, Reports and Related Programs, Part 3 Web-based Education Commission Section 852 Establishment of Web-based Education Commission, a 14-member commission was established (U.S. Dept. of Education, 1998, SEC. 852, ¶1). These amendments took place merely six years after Congress reauthorized the Higher Education Act in 1992. This reauthorization was the first time that distance education students could receive Title IV federal student aid. Still leery of telecommunicated instruction and as an attempt to prevent fly-by-night schools from popping up to access the now available Title IV federal dollars for distance education, Congress imposed a number of eligibility restrictions on institutions. These included a limitation on the percentage of courses that could be offered by an institution via telecommunications or correspondence (Salomon, 2004).

> But Limitations or no, this access to student aid dollars, plus the pace of technology and the internet over the next five years—helped to fuel the rapid growth of distance education. By the time Congress next reauthorized the Higher Education Act in 1998, distance education had evolved from the educational sideline of a few institutions into a mainstream method of delivery for many. (Salomon, 2004, ¶. 2)

The Higher Education Amendments of 1998 authorized the Secretary of Education to choose a group of institutions at which various students aid statutory and regulatory provisions could be waived to promote the expansion of distance learning at those institutions. Annual evaluation reports were required from the Secretary of Education. The concern over the possibility of corporatization of colleges and universities based on the introduction of Internet instruction lead to critical discussion about the idea of these institutions becoming "digital diploma mills" (Stedman, 2002, p. 10).

Currently, the Higher Education Act is in the reauthorization status. In the area of distance education significant changes have occurred. "In 1997-1998, roughly one-third of 2- and 4-year postsecondary institutions offered courses using distance education. Significant portions (about 20%) of postsecondary institutions were planning to offer courses using distance education over the next 3 years" (U.S. Department of Education, *Distance Education at Postsecondary Education Institutions*: *1997 – 98*). The interest in distance education has raised substantial issues for HEA Title IV student aid programs. "The federally established Web-based Education Commission reported in December 2000, that certain HEA provisions are unnecessarily restricting the legitimate growth of distance learning, and in turn limiting access to postsecondary education" (Stedman, 2002, p. 10). Results from the evaluations submitted by the Web-based education commission to the Secretary of Education and the demonstration sites are likely to be considered by the Congress as it debates what HEA statutory changes including those in H.R. 1992 may be appropriate to accommodate the delivery of instruction through

telecommunications while safeguarding federal student aid dollars (Stedman). As the reauthorization progresses, entities involved in eLearning are looking to local, state, and federal government for change that will make a real difference to many students. Federal changes can impact the distribution of financial aid and enable students to pursue higher education at a distance (Salomon, 2004, ¶.5). State and local decisions are anticipated to impact the people, policy, and technologies that will continue to promote the continued advances in virtual programs.

State and Local Policy

One such example is the State University System in Florida. The state university statistics for Florida report tremendous gains in distance learning programs in recent years.

> Web based instruction increased by 43.6% over the previous year. Approximately 67% of the distance education course sections used more than one technology to deliver instruction. This is up from 25% last year, indicating increasingly diversified use of instructional technologies for course development. The total number of students enrolled in distance education continues to grow at a healthy rate each year with a 46% increase in headcount over the previous year. (Department of Education - Division of Colleges and Universities, 2004, ¶. 2)

Distance education, specifically web-based course delivery still has hurdles to overcome. Faculty report that preparing online distance learning courses is very time consuming and costly (Maid, 2003). “Few colleges and universities have the support infrastructure in place for multimedia or web-based instruction, and they provide little incentive for busy faculty to take time from their research and classroom teaching to prepare online courses” (Baer, 2000, p. 460). The fact remains that distance education advantages for postsecondary students are perceived as greater than the drawbacks. Secondary educators began to investigate these advantages and are rapidly moving into the eLearning arena. “Through the use of wireless computers and distance learning equipment, high school students are linked to the college campus and college resources”

(Harvey, 2004, p. 73). Not only are secondary students connecting to college campuses and resources, they are using the virtual environment to address their own specific needs.

The first virtual education programs specific to state high school curriculum in the United States were introduced in Florida and Hawaii in 1997. “By beginning these programs at the high school level, students gain information on technology related careers and emerging career opportunities in information technology fields” (Harvey, 2004, p. 73). In addition, federal funding helped begin the largest virtual high school consortium, the Hudson-Concord Virtual High School. “The Hudson-Concord Virtual High School (VHS) Project, conducted between 1997-2002, was a cooperative of over 100 high schools throughout the country and abroad” (Zucker et al., 2003, ¶1).

> Virtual High School was originally funded entirely by a $7.8 million U.S. Department of Education Technology Innovation challenge Grant and school districts had free access from 1996 – 2001. VHS began charging for its courses in 2002. The cost of a VHS course is $6000 annually for up to 25 students each semester. (Goldman, Griffin, Dean, & Moss 2004 p. 20)

“Responding to the need for alternative education, virtual schools are multiplying rapidly across the nation. Many states have taken the lead with virtual school initiatives or are sponsoring virtual schools through various funding sources” (Politoski, 2002 ¶2) (see Table 1). While other states encourage or allow cyber charter schools but have yet to establish a state virtual school project. Minnesota, Ohio, and Texas, for example, have varied approaches to eLearning for secondary school students but no state virtual school initiative. Some of these approaches include vendors that provide both content and delivery. An example of a fee-based program meeting a specific need is the Apex Learning Program. This program offers a cadre of advanced placement courses to students all over the nation for a fee. “During 2000/01 school year, nearly 50,000 students in 48 states enrolled in Apex Learning online curriculum” (Rose, 2003, p. 4).

Table 1

Policy and Funding Comparisons

State	Virtual School Funding Model	Virtual Program Legislation
Alabama	State Legislative Allocation Grants Tuition	
Arkansas	Grant	State Department of Education Initiative
California	Full-time Equivalency Grant	University of California College Preparatory Initiative AB 294, 2003
Colorado	Full-time Equivalency	Legislative Initiative, funded 2002
Florida	Full-time Equivalency	Legislative Initiative, funded 1996 Florida Bill 1533
Georgia	State Legislative Allocation	State Department of Education Initiative Gubernatorial Initiative, January 2005
Idaho	Full-time Equivalency	Legislative Initiative 2002 SB 1444
Illinois	State Legislative Allocation	Board of Education Guidelines
Kentucky	State Legislative Allocation Federal Funds School Districts Tuition	Gubernatorial Initiative, January 2000 Executive Order
Louisiana	State Legislative Allocation Grant	State Department of Education Initiative
Maryland	State DOE	Maryland Bill 1197
Michigan	State Legislative Allocation Grant	Legislative Initiative, The Revised School Code, Act 451 of 1976, Section 380.1481
Mississippi	Grant	State Department of Education Initiative
Texas	State Legislative Allocation	Legislative Initiative SB 975, 2001
Virginia	State Legislative Allocation Tuition	Gubernatorial Initiative, June 2003 Legislative Initiative, funded may 2004
West Virginia	State Legislative Allocation	Legislative Initiative, July 2000
Wisconsin	Grant	Legislative Initiative

However, in Florida, where the entirely state-funded Florida Virtual School provides online courses to instate districts free of charge, those online classes can be seen as a savings (Goldman, Griffin, Dean, & Moss, 2004). Online courses bring better access but little impact on the bottom line. A small rural district in Florida probably cannot afford to hire an instructor to teach advanced placement chemistry to the ten students who may want the class. But at no cost, the district can arrange for those ten students to take the AP class online (Goldman et al., 2004). "Small schools and rural schools may realize special benefits by being able to offer a broad range of courses typically available only in larger schools and districts with considerable resources" (Donlevy, 2003, p. 120)

Considerations for states as they move forward in creating policy concerning secondary education in the virtual arena include: funding, Carnegie units, seat time equivalency, curriculum, advanced placement opportunities, and ADA compliance. Appropriate state level policies are needed to keep pace with the rapid expansion of K-12 virtual programs. New educational opportunities can be made available to students across the nation through these programs. As the National Association of State Boards of Education warned two years ago, 'In the absence of firm policy guidance, the nation is rushing pell-mell toward an ad hoc system of education that exacerbates existing disparities and assure a high standard of education across new models of instruction' (NCREL, 2004, p. 10). Funding, standards, and access continue to be a consideration for policymakers as they look at eLearning policy.

> With the exception of statewide supplemental programs, funding for cyberstudents is typically tied in some way to state FTE funding. Few states have made policy decisions to fund online students in ways that differ significantly from funding for students in physical schools. No state has created detailed curriculum standards for online courses. All states require that online courses meet state content standards, in the same way that all courses in brick-and-mortar schools must do. These standards, however, do not address issues specific to the online environment, either in content development or delivery." (NCREL, 2004, pp.72 -73)

Along with the advances in eLearning opportunity come the considerations of access. “Section 508 requires that electronic and information technology is accessible to people with disabilities”(U.S. Dept. of Education, SEC 508). Considerations for delivery of content to secondary students must consider the federal legislation designed to provide access to technologies for people with disabilities. “The Center for Information Technology Accommodation (CITA), mission is to advance technologies and policies which enhance access to electronic information for persons with disabilities”(SEC 508).

> Statewide programs address access issues through a mix of adherence to federal laws (e.g., the Americans with Disabilities Act) and processes designed to meet such needs. There are no examples of policies related to access that are specific to the online environment and go beyond ADA requirements, but all statewide programs indicate some level of accommodations in practice in developing and delivering courses. Program representatives interviewed also believe that part of the responsibility for accommodations falls on the local schools in which participating students are enrolled. Legislation creating IDLA, for example, states that online courses must be available to all students who want to participate; but in practice, much of the responsibility falls to local schools. (NCREL, 2004, p. 80)

Federal, state, and local policymakers must continue to revisit the existing policies to include eLearning environments for secondary students. The implications for K-12 education for eLearning opportunities are significant and have begun to be evaluated as the opportunities continue to increase across the nation.

In *The Virtual High School: Teaching Generation V,* the book examines the implications of online learning for K-12 education, primarily through a study of the Virtual High School. According to Zucker , “Claims of increased educational access for students and teachers as probably the primary argument in favor of online learning” (as cited in Goldman et al., 2004, p. 21). Among the reasons for developing a program, the selection of the model is one of the primary steps. There are several models for building a virtual high school program. In the conventional vendor model, an academic institution buys or leases hardware and software for

providing online distance learning. “For-profit firms such as Blackboard.com, Cnequest, click2learn.com, convene.com, eCollege.com, VCampus, WebCT, and IBM have developed sophisticated technology platforms and authoring tools which they are aggressively marketing to colleges and universities” (Baer, 2000, p. 461). As with all new programs and initiatives, there are serious concerns, quality control being a frontrunner. “Concerns about quality control are easily addressed by maintaining the same curriculum, syllabus, objectives and textbook as a traditional on-campus course” (Harvey, 2004, p. 74). Similar to postsecondary programs, the general perception is that the gains are more substantial than the drawbacks, and the programs are growing exponentially.

> A study by Eduventures, a Boston-based firm that examined several state and district-sponsored virtual school programs in 2003, documented the escalating enrollments. More than two dozen school districts across the country have started to offer their own online courses to their own students, according to 2002 data from the Distance Learning Resource Network. During the 2002 – 03 school year, 180,000 students in K-12 were enrolled in online courses, according to a Peak Group study, which projected one million enrollments by the 2004 – 05 school year. (Goldman et al., 2004, p. 21)

“The rapid development of virtual schools and their blended use of traditional content and technology has garnered a tremendous amount of interest and raised a lot of new questions” (Peak Group, n.d., p. 1). “The virtual high school is a quickly growing educational trend with implications for the future of education” (Zucker, et al., 2003, ¶1)

People and Technology

Student Perspective

Advantages and disadvantages to distance education, specifically web-based course offerings, are still being unearthed. The general perception of virtual learning is any time, any place, and these attributes are considered advantages by students who avail themselves of online

learning opportunities. “The biggest advantage of online learning is the capability of working at your own pace at any time” (Advantages of Online Learning, 2003, ¶3).

Key to students’ participation is flexibility and opportunity. Attempts in Plano to provide options that allow students to choose when and where they will attend classes are being replicated in school districts across the country. The growth of virtual school alternatives as a way to give students more flexibility in attaining course credits for graduation is escalating (Goldman et al., 2004). Innovative opportunities for students for credit recovery and course enhancement improve education for students. Advanced placement courses that often have scheduling conflicts for students can be made available more easily through enrollment in eLearning courses. Virtual programs from traditional public school systems, charter schools, and consortium efforts deliver these opportunities. Educational reforms and eLearning technology for the 21st century can provide the access to quality educational options at a level beyond what we have thus far been able to obtain (Thomas, 2003).

Administrator Perspective

Other advantages include benefits to the local school and school district. The opportunity for cost efficiency was discussed earlier, but there are additional advantages. Scheduling conflicts for high school students prevent access to desired advanced placement electives and other courses with limited offerings. Web-based course delivery can assist in eliminating some of these conflicts. Voice over Internet protocol and one-to-many video-conferencing components enhance these web-based courses. Students work independently in eLearning courses to access instructional materials from the Internet providing additional opportunities to prepare for the college environment (Harvey, 2004). Online courses create opportunities for school districts to offer students courses that would otherwise not be available, to gain 21st century skills through

online collaboration, online team activities and group projects, and to participate with learning communities with students beyond their brick-and-mortar methods of learning. Adding online education to a student's face-to-face experience can enable students to become a part of a global community of learners. Administrators considering online instruction within their districts face many decisions. "Ultimately, much of the decision to provide online courses will come down to resource availability" (Goldman et al., 2004, p. 14). In fact, this access to information and resources has been recognized as a key advantage to online learning. Students are provided opportunities to interact with experts in other parts of the world. Students have access to databases, libraries, and other online resources which amount to millions of documents at their fingertips, and more information is posted to the Internet each day (Zucker et al., 2003). Availability of resources notwithstanding, virtual learning programs continue to crop up and appear to be thriving. According to a recent study by Interactive Educational Systems Design, STATS, more than 50 percent of U.S. high schools now use online courses as a part of their curriculum offerings to students (Goldman et al., 2004).

New frontiers present problems that have no easy solutions, and virtual high school education is no exception. Technology is often looked upon for answers to education ills, but it poses as many problems as solutions.

> We're too wedded to the traditional school, course, and class model. Issues to watch are two fold, access issues including universal design and requiring students to own computers and internet access and then data collection issues, looking for disaggregated student performance data. Research directions should include learning about online interaction patterns to improve communication and effective online synchronous learning models. Policy concerning funding requirements and teacher certification must be addressed and should include seat-time discussions as well as 'ownership' of students. (ADA) Technology advancements in open source courseware, learning objects and standards for use of content, including the Sharable Content Object Reference Model (SCORM) must also be monitored. (Rose, 2003, ¶ 11-13)

In short, “this means never taking the technology, or the information it contains, at face value” (Sinker, 2001, p. 33).

Educator Perspective

Beyond access, there are other considerations for students. In a virtual program, the student expectations are responsible for learning shifts. Students must consistently interact with eLearning course content without regular social interaction with peers or instructors. Questions arise about the value of social and emotional learning in a virtual course as compared to a traditional course delivered in a brick-and-mortar school. Students with motivation problems, learning disabilities, and low reading levels may struggle to maintain engagement with an eCourse. Students must be provided with the technology support in order to be successful. Technology support considerations must be an essential element of a virtual high school program. As with all distance learning opportunities, high quality and timely support must be provided. The idea that technical support is critical to the success of students in a virtual program is commonly supported by eLearning course providers and developers at all levels of education (Donlevy, 2003). Considerations outside of technology advancements and student access include teacher training, planning, and time involvement. Postsecondary instructors largely consider planning and implementation for a web-based course to outweigh the advantage to the instructor, and this is no different in the virtual high school arena.

> When teachers start looking at the methods they use while teaching in electronic environments, they discover that every virtual environment is different. The web is different from text only. Synchronous is different from asynchronous. Video (and, yes video that is both interactive and streamed is virtual) is different from the web. (Maid, 2003, p. 41)

Teachers often feel unprepared to work in the various environments, and learners’ expectations in a virtual classroom are different from those in a traditional classroom. Teachers are also faced

with learning multiple software applications in order to effectively produce a course for their audience.

Scalability and Reliability

Social and emotional learning in a virtual course is comparable to a traditional course delivered in a brick-and-mortar school. Web-based distance education offers the ideal combination of self-paced learning and interactivity. “Any time, any place, any pace” can be used to reference Internet-based distance learning courses. Students are provided the opportunity to schedule their time for convenience and take courses from any location at any hour of the day or night. Social interaction is provided through asynchronous technologies: online discussions, e-mail-support collaboration, and interactive presentations using archived or live webcasts (Frankola, 2001). These technologies assist in creating a sense of community for students. Technology becomes its own governor; “real-time” interactive virtual classrooms play an important role in distance learning. “However currently available systems are insufficient in supporting large-scale user access, and they cannot efficiently support accessing with heterogeneous devices and networks” (Shi, Xu, Xiang, & Zhang, 2003, p. 28). Efficient programmers consider technology shortcomings and are planning and preparing for technological advancements that will support excellence in virtual education while using currently available technology. Individual student technology access becomes a primary consideration in course design, but again stellar “distance learning uses all available media and technologies” (Baer, 2000, p. 459).

The most cumbersome of these new media and technology products is reportedly the delivery courseware elected by the school or district.

> The problem is that the course delivery software seems to be constructed around a particular kind of pedagogy – the virtual equivalent of the large lecture hall, where

> students listen, take notes and are then tested, using multiple-choice tests. (Maid, 2003, p. 42)

This is not the ideal format for all courses, instructors, or students. Additionally, "the new computer technologies are not the panacea for students who want to know if this is going to be on the test. So whom are we serving when we look at distance education options?" (Watts, 2003b, p. 98).

> While we tend to embrace technology because it is a social and cultural norm, we must remain diligent about technology's ability to standardize and be careful that it does not lure us into what can only be called "one-size fits all" education. Finally, we must resist the belief that technology will provide an easy and magic answer for all our ills. (Maid, 2003, p. 43)

"This issue addresses technology—specifically the new computer technologies—as a new cultural symbol" (Watts, 2003a, p. 3). Technology will not solve our money problems. In most instances, it will likely cost more than it will bring in. "Interestingly enough though, if used wisely and effectively in the delivery of distance learning courses, technology might, over time, make money" (Maid, 2003, p. 40).

Summary

Secondary education is not in the business of making money. However in the current budgetary state, programs that can solve problems, save money, or possibly be developed as self-sustaining entities have mass appeal. This appeal is particularly well received when the problems addressed by the program are centered about teaching and learning. "Adding online education to a student's face-to-face experience can enable students to become a part of a global community of learners" (Goldman, et al., 2004, p. 14). New opportunities are afforded by computer technology—opportunities that allow educators to focus on learning rather than on teaching. It is suggested that "pedagogy, the art of teaching, under its various names, has been adopted by the academic world as a respectable and important field. The art of learning is an academic orphan"

(Papert, 1993, p. 82). Focusing on the art of learning will impact the establishment of virtual communities of learners.

> And what are virtual communities anyway? How do they form? Why do they form? Answers to these questions will guide us as we define for ourselves emerging communities; made possible by new technologies. Does technology put the learner in the driver's seat?" (Watts, 2003a, pp. 9-10)

> We are in the midst of a revolution that will profoundly alter how we learn, work, and communicate, and conversations emerge about philosophical considerations inherent in the use of these technologies. The conversation is alive in the field of education, but, too often, it is centered on technology's being a "quick fix" for the ills of our educational system, be it at the kindergarten or the college level – or any point in between.(Watts, 2003a, p. 5)

Educators must constantly remind themselves that "technology is a catalyst in that it affords all of us an opportunity to revisit how, what, and why we are teaching" (Watts, 2003a, p. 6). Nevertheless, "we need to perhaps come to terms with the explosion of technology that promises to change our educational paradigm" (Watts, 2003a, p. 3),

> Seven principles of good practice as they relate to technology have been identified. Chickering and Ehrmann (1996) suggest frequent student-faculty contact, using a team approach with students, active learning strategies, and feedback loops between students and the faculty – raising the bar and making the expectations high, as well as creating an educational atmosphere that respects diverse talents, intelligences, and learning styles. (Watts, 2003a, p.6)

How can we look at the events that appear to be shaping our future, and how can we have some say about how and when they might occur? After all, it is the students who are the Net generation, the visual learners by and large, the media groupies, "the ones whose view of the future is guided more by those television commercials and science fiction films than by our attempt to provide them with direction within an education environment" (Watts, 2003a, p. 7).

CHAPTER 3

METHODOLOGY

Overview

The design of research includes the presentation of the methods and procedures used to collect the data, the description of the panelists included, and the discussion of the method used to analyze data and report findings. The study was designed to identify critical components of distance education as it relates to web-based course delivery for students in Grades 9-12. The research provides direction for the study of teaching and learning in virtual classrooms.

Methodology

The instrument consisted of a written questionnaire containing three sections:

1. Initial Questionnaire: Request for key elements by category (see Appendix B).
2. Survey for Ranking: Elements from initial survey ranked using Likert scale (see Appendix C).
3. Reported Ranking Criteria with request for feedback, criteria ranked by mean with elements removed when the mean score was greater than or equal to 2.0 (see Appendix D).

Each panelist was given identical questions to answer. Panelists were administered the initial instrument through electronic mail and were asked to complete and return the initial instrument over a two-week period. Panelists were encouraged to participate throughout the study; however, continued participation could not be guaranteed and was addressed as a limitation of the study.

The results of the survey criteria were shared with the panelists who were asked to rank the criteria over a continuum of importance.

The development of the instrument included an initial questionnaire soliciting a list of criteria that all thought appropriate in the areas of policy, people, and technology. The questions in the instrument were designed to elicit responses concerning critical components relating to distance education, specifically web-based course delivery for students in Grades 9-12. The questionnaire was submitted electronically via email in November 2004, and panelists were asked to submit a response within ten business days.

A participation rate of 25 percent or higher was considered acceptable for continuation of the study. A second survey instrument was created based on this information. The request for participation in the second survey was then sent out to all 57 panelists in January 2005, both to those who participated in the first round and those who did not. Panelists were asked to respond to the survey within ten business days. The survey was conducted using a web-based instrument found at http://education.websurveytool.com and respondents ranked all criteria using the scale of: (1) critical, (2) indispensable, (3) expendable, or (4) unnecessary. Each panelist ranked the list individually and anonymously. A participation rate of 25 percent or higher was considered acceptable for continuation.

If the desired 25 percent was not met, a second solicitation was to be released, after which point continuation of the study was based on the response percent. Upon receipt of the second survey instrument results, the researcher calculated the mean and deviation. Items were removed which had a calculated mean greater than or equal to 2.0. The criteria were then placed in rank order and shown to all 57 panelists (anonymously). Possible reasons for items with high standard deviations were noted. Panelists were asked to order, modify, and/or add to the initial

responses based upon their review of other members' ideas. While panelists were encouraged to participate throughout the process, there were no methods in place to record or guarantee participation of any individual panelist. These data were collected and reviewed by the researcher. A final report was prepared and distributed to panel members before results of the study were released to others.

Procedures

Panelists were selected from eLearning courseware and technology support providers, state and national committees, and virtual high school programs and projects. The majority of panelists, 72% were currently in educational roles with virtual school programs, with 68% involved in programs that included Grades 9-12. eLearning courseware and technology support panelists comprised 14%, and members or employees of state and national committees comprised of 29%. There was an overlap in affiliation for some of the panelists; some educators also served as members on state and national committees. Additionally, several eLearning courseware and technology panelists were former educators.

Panelists name, entity(s) to which they were affiliated, position or position title, and email contact information was obtained for 74 panelists. The 74 panelists were drawn from around the United States. Virtual programs varied in terms of size and constituents served, ranging from a relatively small district with fewer than 700 students to state and national programs serving more than 10,000 students. Names were obtained from the following sources: membership lists, 2004 virtual high school conference participation, courseware provider user information, and references from the literature. During the initial survey release, it was discovered that available email contact information for 17 of the participants was no longer valid. All returned mail with a delivery receipt error was re-sent once more to ensure accuracy of

the electronic address information. Panelists with information that was found to be no longer valid were removed from the panelist list. This reduced the number of panelists from 75 to 57 for participation in the three components of the study.

Data Analysis

A modified Delphi Prioritization Procedure was used for collection and analysis of the data. This technique provided a set of procedures for collecting opinions of experts in the field concerning questions that impacted their field of expertise or met prescribed requirements (Cline, 2000). The following were the procedural steps adopted:

1. Selecting the panel of experts. The panelists were required to have an intimate knowledge of the items or be familiar with experiential criteria that would allow them to identify the items effectively.

2. Identifying a list of criteria in each of the following areas: policy, people, and technology. In an initial questionnaire, list of criteria that all panelists thought appropriate were determined. At this stage, there were no correct criteria. However, technical merit and cost were two primary criteria; secondary criteria were to be specific.

3. The panel ranking the criteria. A second instrument with the list of criteria for each of the areas was developed from the initial instrument. For each criterion on the second instrument, each panelist had to rank it as: (1) critical, (2) indispensable, (3) expendable, or (4) unnecessary. Each panelist ranked the list individually and anonymously.

4. Calculating the mean and deviation. Items in the list were to be removed which had a calculated mean greater than or equal to 2.0. The criteria were then placed in rank order and shown to the panel (anonymously). Reasons for items with high standard deviations were noted. The panel members could insert removed items back into the list after review if they so wanted.

5. Analyzing the results and feedback to panel. This involved finding the mean ranking for each item, producing a table of ranked items, and showing the ranking to the panel. Items which had a calculated mean greater than or equal to 2.0 and a standard deviation of less than .75 were considered to have consensus. Re-inserted items in the list and qualitative comments from panel members were included in the analysis.

Implications

Upon completion of the study, the findings were prepared and discussed. Comments on the aspects of this research requiring further study and its additional limitations noted in the process of conducting the study were reported along with the implications of the research for education, particularly, virtual education programs for students in Grades 9-12, which are presented in Chapter IV.

Summary

This descriptive, analytical study was conducted using a modification of the Delphi Prioritization Procedure, which allowed the investigator to collect data on critical components from a panel of experts and analyzed the resulting information, data obtained to be interpreted, conclusions drawn and recommendations suggested concerning perceptions of experts in the field of virtual education. By exploring the key criteria of distance education, specifically the virtual classroom in Grades 9-12, courseware providers, teachers, and administrators identified potential issues in emergent technologies and legislative policies. By discussing the essential elements application to the virtual classroom, administrators began to determine professional development needs for online educators and identified the attitudes and skills that positively impact potential online learners.

CHAPTER 4

FINDINGS

As stated in Chapter 1, the purpose of this study was to identify key components of distance education as it relates to web-based course delivery for students in Grades 9–12. The research was centered on three areas: *people*, *policy*, and *technology*.

Initial Survey

An initial survey (Appendix B) was distributed to panelists via email, contact information obtained from membership lists and references from the literature. As a modification to the initial open sessions of a Delphi prioritization method, panelists were asked to respond freely and without boundaries to a series of three instruments. The first instrument consisted of three questions—one question each in the areas on which the research was centered. A response rate of 29.8% was obtained for the first instrument with 17 panelists responding.

Research Question 1

The first instrument was designed to solicit a response for the question: What are the key components in policy, people and technology in online education for students in grades 9-12? The first question in the series of three asked of panelists on this instrument requested that panelists consider the area of policy. Panelists were asked to respond to the survey with their perception of the key criteria in legislative and educational policies that directly or indirectly influence the process of implementing, funding, and maintaining an online educational program for students in Grades 9-12. Survey results for the area of policy included references to legislative policies that must be considered as virtual programs continue to expand such as Full Time Equivalency (FTE), Section 508, IDEA 1997, and Americans with Disabilities Act (ADA).

However, the majority of responses was references to state and local program policies such as professional learning and mentor requirements, best practices for teachers, standards for evaluation of teachers in a virtual environment, standards for evaluation of course content and establishing alignment to high-stakes tests. Responses from participants that overlapped were combined. For example, several respondents addressed policy directing compliance for special needs students including Section 504, IDEA 1997 and ADA. A single response that addressed each of the concerns was selected for the second survey instrument to decrease redundancy. Additionally, compound responses from panelists were relayed back to panelists as separate responses for the second survey instrument. An example is 24/7/365 technical support for students and teachers was asked as two criteria on the second instrument; 24/7/365 technical support for students, and 24/7/365 technical support for teachers.

The second question to panelists in the initial instrument requested them to consider people in virtual programs. Panelists were asked to consider how people directly or indirectly were impacted by online education programs for students in grades 9–12. Panelists were instructed to think in terms of students, faculty/staff, and facilities. Survey results in the area of people converged into engagement, support, and training. Student engagement with each other, with their instructors, and with the curriculum as well as the engagement of curriculum and technology leaders in the virtual program initiative were the common focus responses. Support for students in the classroom with access to an onsite facilitator as well as support of online instructors had to be considered. Training for instructors was addressed through mentoring and collaborative efforts. Interestingly, facilities were only addressed as access points for technology and support personnel.

The third and final question asked of panelists in the initial instrument requested panelists to consider the area of technology. Panelists were asked to consider the technology necessary to create, deliver, and monitor online education programs for students in grades 9–12. Panelists were instructed to think about technology in terms of students, faculty/staff, and courseware/delivery systems. Reliability, compliance, and scalability were addressed by panelists. Technology support for students and teachers 24/7/365, access to technology from school and home as well as access to recourses for teachers and students electronically were among the results of the survey in the area of technology criteria.

Second Survey

The second survey instrument (Appendix C) was built as a web-based interactive database. All criteria solicited through the initial instrument were categorized and listed in no particular order.

Research Question 2

The second survey instrument was designed to determine the order or priority for the key components identified. The response rate for the second survey instrument was 36.8% with 21 panelists responding. Panelists were asked to rank the criteria on the second instrument by accessing the survey at http://education.websurveytool.com, the panel ranked the items as: (1) Critical, (2) Indispensable), (3) Expendable, (4) Unecessary. Each panelist ranked the list individually and anonymously. The database was developed to require a response to each item prior to submission of the data. Upon receipt of the data, the mean and deviation for each item was calculated. Items in the list were removed if the mean calculated was greater than or equal to 2.0.

Table 2

Results from Second Survey Instrument

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
33	Focus on student academic needs	1.33	0.47
57	Engagement between students and the teacher	1.33	0.47
1	Establish FTE/ADA funding policies	1.33	0.57
2	Establish alignment to state/national standards	1.44	0.68
25	Engage curriculum and technology leaders together in the initiative	1.5	0.60
56	Engagement between students and the content	1.5	0.60
59	Professional development to assist teachers in the move from a traditional classroom to practice in a new modality	1.5	0.60
31	Collaboration with state policy makers	1.55	0.59
41	Establish best practices for teachers	1.55	0.68
45	Student success data for virtual learning environment	1.61	0.48
30	Collaboration with education community	1.61	0.59
32	Establish support and monitoring of online instructors	1.61	0.59
72	Reliability: ensure sufficient redundancy to ensure that failures have no perceptible impact on users and that data integrity remains intact	1.61	0.59
9	Standards for evaluation of teachers in a virtual learning environment	1.61	0.67
27	Scalability of personnel	1.61	0.67
52	Asynchronous communication tools	1.61	0.75
26	Involve education community at the local and state level in the initiative	1.66	0.47
62	Compliance for special needs student requirements (508, IDEA 1997)	1.66	0.57
64	Student access from school	1.66	0.57

(table continues)

Table 2 (continued)

Results from Second Survey Instrument

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
28	Scalability of LMS	1.66	0.66
34	Establish methods for frequent feedback to student participants in a virtual learning environment	1.66	0.74
43	Mentors for teachers new to virtual learning environment	1.66	0.74
73	Security: prevention of service interruption resulting from infection with viruses, etc., -- ensuring that services are not disrupted and privacy is not violated by hacking or malware	1.66	0.81
12	Examine policies presently in place that may serve as barriers to the development and full use of online learning	1.66	0.88
5	Ability to demonstrate improvement in student achievement, for all students (broken out by subgroup)	1.72	0.55
39	Teacher evaluation of online program	1.72	0.55
38	Student evaluation of online program and course of study	1.77	0.53
46	Accommodation of different learning styles online	1.77	0.53
8	Standards for evaluation of course content	1.77	0.62
40	Needs assessment for students/system and/or state	1.77	0.62
42	Collaboration with other online teachers for resources and sharing	1.77	0.62
58	Engagement between students and each other	1.77	0.71
55	24/7/365 Technical support for teachers	1.77	0.78
4	Establish alignment to high-stakes tests	1.83	0.60
37	Access to electronic resources to assist with instruction: textbooks, special software, audio, video	1.83	0.68
50	Course Management System	1.83	0.68
36	Student orientation to online learning environment and necessary technical skills prior to participation	1.83	0.76

(table continues)

Table 2 (continued)

Results from Second Survey Instrument

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
67	Sharable Content Object Reference Model (SCORM) Compliance	1.83	0.76
6	Examine 'seat time' equivalency policies for virtual learning environments	1.88	0.65
35	On site facilitator access for students participating in a virtual learning environment	1.88	0.73
54	24/7/365 Technical support for students	1.88	0.73
65	Internet Acceptable Use Policy for students	1.88	0.80
13	Establish a protocol for continual feedback to policy makers regarding costs to ensure adequate funding	1.88	0.87
63	Student access from home	1.94	0.62
3	Technology standards for virtual learning environments at high school and grade k – 8	1.94	0.70
53	Assessment building tools	1.94	0.70
60	Multiple technology methods for student engagement	1.94	0.70
66	Internet Acceptable Use Policy for teachers	1.94	0.77
11	Establish consistent data measures for student learning across virtual programs	2	0.47
71	Software scalability – a software architecture that enables applications to grow without limitations	2	0.66
15	Research into the efficacy of electronic education at the high school and k-8 level	2.05	0.70
48	Student Information System	2.05	0.70
17	Student Registration System	2.05	0.77
44	Teacher retention data for virtual learning environment	2.11	0.56
70	An underlying infrastructure to provide high performance data access, with real-time replication rather than scheduled backup processes	2.11	0.65
61	Open standards course delivery system	2.11	0.73

(table continues)

Table 2 (continued)

Results from Second Survey Instrument

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
69	Real time responsiveness	2.11	0.87
7	Policies concerning the issuance of Carnegie credit	2.11	0.93
14	Establish policy **requiring** participation in the State Virtual High School as an alternative for students when courses are not otherwise available	2.11	1.04
47	Parent evaluation of online program and teacher	2.16	0.60
68	Learning Object Repository (L. O. R.)	2.16	0.68
24	Resource repository	2.22	0.62
49	Grading Program	2.22	0.85
22	System to catalogue, search, and name courses/ resources that is generally accepted	2.27	0.65
29	Collaboration with private sector	2.27	0.65
18	Course repositories separate from the course creation/management software	2.27	0.73
23	Ability to license certain courseware products on a statewide basis	2.27	0.80
20	Ability to redesign user interfaces of courseware products for different users	2.27	0.86
21	Ability to integrate textbook content or assessments into courseware products	2.33	0.74
51	Synchronous communication tools	2.33	0.74
10	Establish certification program for teaching in a virtual environment (similar to TSS or Gifted in-field add-on certifications	2.38	0.89
19	Independent course authoring systems that also classify learning content	2.5	0.76

Of the 48 criteria that remained in the instrument after eliminating those items with a mean greater than or equal to 2.0, seven items with a standard deviation greater than or equal to .75 were included. Items with a standard deviation greater than or equal to .75 were considered to have a high standard deviation. Reasons for the high variation of response to these particular items include panelist expertise and comfort in responding to particular items and existing policy in state and local districts currently operating virtual education programs for Grades 9-12. Panelists ranged in expertise with virtual programs with veterans having 10+ years in virtual education programs and novices having had fewer than two years in virtual programs. Criteria in the instrument may also have been seen as unnecessary as current policies are in place to address them, such as acceptable use policies for both teachers and students.

Table 3

Items to Note Due to Standard Deviation Greater than or Equal to .75 (Step 4 of Process)

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
52	Asynchronous communication tools	1.61	0.75
73	Security: Prevention of service interruption resulting from infection with viruses, etc., -- ensuring that services are not disrupted and privacy is not violated by hacking or malware	1.66	0.81
12	Examine policies presently in place that may serve as barriers to the development and full use of online learning	1.66	0.88
55	24/7/365 Technical support for teachers	1.77	0.78
36	Student orientation to online learning environment and necessary technical skills prior to participation	1.83	0.76
67	Sharable Content Object Reference Model (SCORM) Compliance	1.83	0.76
65	Internet Acceptable Use Policy for students	1.88	0.80
13	Establish a protocol for continual feedback to policy makers regarding costs to ensure adequate funding	1.88	0.87
66	Internet Acceptable Use Policy for teachers	1.94	0.77

Final Survey

The third and final survey instrument (Appendix D) was sent to panelists with a request to review the ranking of the criteria, reorder, and comment and/or replace items that were eliminated based on the criteria of a mean greater than or equal to 2.0. Additionally, those items with a mean less than 2.0 but with a standard deviation greater than .75 were eliminated from the criteria ranking reported to panelists (Appendix E).

Research Question 3

The third survey instrument provided panelists the opportunity to suggest changes in rank order, modifications to the criteria definitions and/or add to the list of criteria given the rank order determined by the second survey instrument. The response rate for the final instrument was 14%, with 8 panelists responding. No respondents suggested any changes to the reported rankings. No respondents made suggestions to replace items removed based on the elimination criteria of a mean greater than or equal to 2.0. Consensus of the reported ranking is assumed based on the lack of recommended changes and small response percentage. Table 4 includes the responses to the third instrument which are qualitative (see Table 4).

In the identification of the criteria for the three areas of policy, people, and technology, the researcher discovered significant overlap in the opinions of the panelists. Table 5 illustrates the overlap of criteria within the three areas of interest (see Table 5).

Summary

In this chapter; data gathered from the 57 panelists of this study have been reported and analyzed, both in narrative and tabular form. The data were gathered from a researcher-developed instrument containing three survey components. The data were organized about the three survey instruments identifying a list of criteria in each of the following areas of policy,

people, and technology. The data was also organized on the panel ranking criteria as well as the analysis of the results and feedback to the panel.

Based on the findings of this study, Chapter 5 includes the summary, conclusions of the study, with recommendations for future research.

Table 4

Qualitative Responses

I'm curious about the omission of specific items, but not necessarily surprised. Object repositories and S.C.O.R.M. compliance criteria ranked considerably lower than anticipated.
Technological tools to assist in data collection and reporting were absent from the instrument entirely
24/7/365 Support for teachers and students was reported as key criteria based on the elimination standard of a mean of 2.0 or greater, however the need for teacher support is ranked considerably higher than that of students.
This study could have implications for other studies in state and federal legislative discussions; can the raw data be shared with panelists?
What will the impact to faculty be? Scalability of faculty is addressed as a key element, but this will have a residual impact on faculty in traditional brick and mortar schools.
Accountability and high stakes testing as well as assessment development and teacher training are components of the No Child Left Behind legislation.
Teacher certification – do we need a formal online teacher certification program?
How do we measure success? What data can be used to support measurements? We need some consistency among all online programs.
Reliability of technology is a component, but user-friendly for both students and teachers should be considered as well as reliability.
Access to electronic resources, particular text materials is a hurdle in the not to distant future of K-12 online programs. Publishers may provide many online textbooks, CD's, course cartridges, and web resources for the post-secondary market but they have largely left the K-12 setting out of these offerings.
Points to consider when looking into eLMS companies could be articulated as a list of minimum considerations or standards for K-12 educators as they pursue virtual programs in their local system.
I feel that the criteria 'establish consistent data measures for student learning across virtual programs' is important. How do we know if online learning is effective if we all are not using the same measures of success? We are trying to compare apples to oranges.

(table continues)

Table 4 (continued)

Qualitative Responses

Additionally, an organized system for cataloging, searching and naming courses/resources that is generally accepted is something we are waiting anxiously for.
The ability to integrate textbook content or assessments into courseware products may not have held as much value for those panelists surveyed who have never participated in the development of a course from the ground up.

Table 5

Survey Criteria Categorized by Focus Areas

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
	People		
33	Focus on student academic needs	1.33	0.47
57	Engagement between students and the teacher	1.33	0.47
25	Engage curriculum and technology leaders together in the initiative	1.5	0.60
56	Engagement between students and the content	1.5	0.60
59	Professional development to assist teachers in the move from a traditional classroom to practice in a new modality	1.5	0.60
32	Establish support and monitoring of online instructors	1.61	0.59
27	Scalability of personnel	1.61	0.67
26	Involve education community at the local and state level in the initiative	1.66	0.47
39	Teacher evaluation of online program	1.72	0.55
38	Student evaluation of online program and course of study	1.77	0.53
42	Collaboration with other online teachers for resources and sharing	1.77	0.62
58	Engagement between students and each other	1.77	0.71
35	On site facilitator access for students participating in a virtual learning environment	1.88	0.73

(table continues)

Table 5 (continued)

Survey Criteria Categorized by Focus Areas

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
	Policy		
1	Establish FTE/ADA funding policies	1.33	0.57
2	Establish alignment to state/national standards	1.44	0.68
25	Engage curriculum and technology leaders together in the initiative	1.5	0.60
59	Professional development to assist teachers in the move from a traditional classroom to practice in a new modality	1.5	0.60
31	Collaboration with state policy makers	1.55	0.59
41	Establish best practices for teachers	1.55	0.68
45	Student success data for virtual learning environment	1.61	0.48
32	Establish support and monitoring of online instructors	1.61	0.59
9	Standards for evaluation of teachers in a virtual learning environment	1.61	0.67
26	Involve education community at the local and state level in the initiative	1.66	0.47
62	Compliance for special needs student requirements (508, IDEA 1997)	1.66	0.57
34	Establish methods for frequent feedback to student participants in a virtual learning environment	1.66	0.74
43	Mentors for teachers new to virtual learning environment	1.66	0.74
5	Ability to demonstrate improvement in student achievement, for all students (broken out by subgroup)	1.72	0.55
39	Teacher evaluation of online program	1.72	0.55
38	Student evaluation of online program and course of study	1.77	0.53
8	Standards for evaluation of course content	1.77	0.62
40	Needs assessment for students/system and/or state	1.77	0.62
4	Establish alignment to high-stakes tests	1.83	0.60

(table continues)

Table 5

Survey Criteria Categorized by Focus Areas

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
6	Examine 'seat time' equivalency policies for virtual learning environments	1.88	0.65
35	On site facilitator access for students participating in a virtual learning environment	1.88	0.73
54	24/7/365 Technical support for students	1.88	0.73
3	Technology standards for virtual learning environments at high school and grade k – 8	1.94	0.70
60	Multiple technology methods for student engagement	1.94	0.70
	Technology		
72	Reliability: ensure sufficient redundancy to ensure that failures have no perceptible impact on users and that data integrity remains intact	1.61	0.59
62	Compliance for special needs student requirements (508, IDEA 1997)	1.66	0.57
64	Student access from school	1.66	0.57
28	Scalability of LMS	1.66	0.66
46	Accommodation of different learning styles online	1.77	0.53
8	Standards for evaluation of course content	1.77	0.62
40	Needs assessment for students/system and/or state	1.77	0.62
37	Access to electronic resources to assist with instruction: textbooks, special software, audio, video	1.83	0.68
50	Course Management System	1.83	0.68
54	24/7/365 Technical support for students	1.88	0.73
63	Student access from home	1.94	0.62
3	Technology standards for virtual learning environments at high school and grade k – 8	1.94	0.70
53	Assessment building tools	1.94	0.70
60	Multiple technology methods for student engagement	1.94	0.70

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents a summary of the study identifying key criteria in virtual education programs Grades 9-12. Findings of the study are presented and conclusions drawn. Suggestions and implications for practice are made, and recommendations for further study are presented.

Summary

The primary purpose of this study was to identify the key criteria in virtual education programs Grades 9–12. A researcher-developed survey instrument was sent to 57 panelists consisting of virtual high school administrators, eCourseware providers, and educators. The data gathered by this survey instrument became the basis for the key criteria in virtual education programs Grades 9–12.

In Chapter 1, the statement was made that there are no generally recognized standards, guidelines, policies, or procedures in place for the development, growth, or maintenance of online education programs. Identifying and determining a rank order for these criteria provided a general guideline for key criteria in virtual education programs Grades 9-12. Chapter 2 presented a review of the literature on virtual education. The review was divided into the history of the school system and curriculum delivery methods, the progress of distance education, federal, state and local policies, perspectives of administrators, educators, and students as well as the scalability and reliability of technology. The review concentrated on Internet-based or eLearning technologies. The need for further research in those areas was demonstrated.

In Chapter 3, the procedures used to accomplish the purpose of this study were presented. The study panelists were determined, the sources and development of the survey documented, and the procedures for data collection, data collection results, and treatment of the data were described.

In Chapter 4, an analysis of the data was presented. The data analysis was reported in narrative and tabular formats. The data were gathered from response to a researcher-developed survey instrument which was divided into the following three sections: (a) identifying a list of criteria in each of the following areas: policy, people, and technology; (b) the panel ranking criteria; and (c) the analysis of the results and feedback to the panel.

Many of the 57 panelists failed to respond to all three portions of the survey. Also of note was that participation was highest for the section of the survey where a simple Likert response for ranking criteria using a web-based data collection device was used. The chapter concluded with a summary of the findings

Discussion

The findings are drawn from the data gathered from the 57 participating panelists and analyzed in this study relative to the absence of generally recognized standards, guidelines, policies or procedures in place for the development, growth, or maintenance of online education programs.

Identification of key criteria began with a modification of a brainstorming session. Panelists were asked to list any criteria they believed to be significant to a virtual program for Grades 9–12 in three significant areas: policy, people, and technology.

Respondents referenced *existing policy*, questioned the impact of existing policy, addressed teacher and student needs as well as the software and technology advances in creating

content management software in the future. When responding in the area of policy, concerns were addressed in funding, Carnegie units, seat time equivalency, Advanced Placement opportunities, and ADA compliance. Concerns centered about the lack of existing and consistent policies and affirmed the National Association of State Boards of Education's warning that the nation is rushing toward an ad hoc system of education that exacerbates existing disparities in the absence of policy guidelines (NCREL., 2004, p. 10). More specifically, ADA compliance was listed as a key criterion by panelists but specific recommendations for compliance or assistive technologies were absent from the criteria list. State programs use a mix of federal laws to adhere to technologies and policies advanced by The Center for Information Technology Accommodation (SEC 508). There are no examples of policies related to access what are specific to the online environment and go beyond ADA requirements (NCREL, 2004, p. 80). In the absence of policies specific to the online environment, the ability to establish, monitor, and maintain compliance, while listed as key criteria, continue to be a challenge to define.

Besides policy, panelists addressed specific criteria in the area of *people*. The majority of the criteria listed in this category centered on communication and support between the various individuals impacted by a virtual education program in Grades 9–12. Curriculum and technology leaders, eCourse instructors, students and parents were considered by panelists as needing to be informed, engaged, and supported. Many of the successful distance learning programs include components which provide a social context for individualized learning (Baer, 2000). While a reported key to students' participation is flexibility and opportunity (Goldman et al., 2004), as with all learning opportunities, high quality and timely support must be consistent and pervasive for student success (Donlevy, 2003). The individualized expectations for instruction are becoming a part of "the student as consumer" of the education process (PBS Roundtable, 2001).

These student consumers are changing the expectations for instructors as well. Instructors' response time and engagement in eCourses are considerably different from traditional instruction. Instructors have also to consider the planning and implementation of eCourses to vary widely depending on the delivery environment selected. Support for instructors to build, manage, and enhance eCourse instruction in any environment is critical (Maid, 2003).

The final category of criteria addressed by the panel was *technology*. The primary focus of the criteria was on eCourseware. Reliability, compliance to legislative standards for assistive technologies and SCORM, scalability and adherence to eLearning standards were considered key criteria. While distance learning avails itself of all available technologies (Baer, 2000), currently available systems are insufficient in supporting large-scale user access with heterogeneous devices (Shi et al., 2003). The most cumbersome of the technology products is the eCourseware. "Course delivery software seems to be constructed around a particular pedagogy—the virtual equivalent of the large lecture hall" (Maid, 2003, p. 42). While educators continue to work with eCourse providers to affect change to the existing technology, the cost to change the pedagogy driving the structure of the eLearning environment may prove prohibitive. However, if used wisely and effectively, eCourse delivery and the technologies that support it may eventually make money (Maid, 2003). Standards for eLearning are absent or inconsistent. Panelists addressed technology standards for virtual learning environments at high school and grades K-8 as well as standards for evaluation of eCourses and instructors in a virtual environment. With more than 50 percent of U.S. high schools, Grades 9–12, now using online courses as a part of their curriculum (Goldman et al.,2004), standards for technology, course content, and instruction are critical.

In the second survey conducted by the researcher, all feedback was shared with the panelists in random order and panelists were asked to rank each individual criterion on a scale of: (1) Critical, (2) Indispensable, (3) Expendable, or (4) Unnecessary. Each panelist ranked the list individually and anonymously. A participation rate of 25 percent or higher was considered acceptable for continuation of the study. Items were eliminated from the list of key criteria which had a calculated mean greater than or equal to 2.0. Twenty-four criteria were eliminated based on the calculated mean. Of those 24 criteria, six referenced state and local policy, while the remaining 18 referenced technology, technology compliance, and individual technology components. The six criteria referencing policy included the issuance of Carnegie credit, required participation in State Virtual School programs, acceptable use of policies for instructors and students, and policies surrounding feedback to policymakers and instructors about the virtual program. There were restrictions on progress and development of new, potentially more effective learning due to policy reinforcement (Rose, 2003). The criteria addressing policy determined to be key criteria through this study lent themselves to the initial stages of establishing policy. The six criteria eliminated specifically addressed policies either already in existence in some state or local programs or in question for other state or local programs. The 18 criteria referencing technology that were removed from the list of key criteria through this study could be categorized as enhancements or improvements to existing eCourseware products such as resource repositories outside of the course management software, changes to underlying infrastructure to provide high performance data access, and synchronous communication tools. These technologies are emergent technologies and should be on the radar of eLearning education and not considered critical criteria for establishing or maintaining a virtual program for Grades 9-12. The criteria determined to be key through this study can be categorized as evaluative

technologies, compliance technologies, and technologies that ensure reliability and scalability. Efficient programmers who consider technology shortcomings are planning and preparing for technological advancements to support excellence in virtual education while using currently available technology (Baer, 2000).

During the initial survey, panelists categorized criteria differently causing overlap in two or more of the three areas of: policy, people, and technology. Based on the initial survey instrument, seven items were categorized by individual panelists as both people and policy criteria (see Table 6). While increased access to educational resources and options is probably the primary argument in favor of online instruction (Goldman et al., 2004), the concerns stem from support. The seven criteria categorized by panelists that focused on both people and policy are centered on support—support for teachers and students in technology and instruction; support for programs through policy and monitoring; and monitoring the progress of students, teachers, and facilitators and providing feedback to support ongoing improvements in eLearning opportunities.

Table 6

Criteria Categorized by Panelists as Both People and Policy Focus Area

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
25	Engage curriculum and technology leaders together in the initiative	1.5	0.60
59	Professional development to assist teachers in the move from a traditional classroom to practice in a new modality	1.5	0.60
32	Establish support and monitoring of online instructors	1.61	0.59
26	Involve education community at the local and state level in the initiative	1.66	0.47
39	Teacher evaluation of online program	1.72	0.55
38	Student evaluation of online program and course of study	1.77	0.53
35	On site facilitator access for students participating in a virtual learning environment	1.88	0.7

Additionally, panelists categorized three items: (a) compliance for special needs student requirements (508, IDEA 1997); (b) standards for evaluation of course content; and (c) needs assessment for students/system and/or state as both policy and technology criteria. Several panelists commented that: “This study could have implications for other studies in state and federal legislative discussions.” According to the web-based Education Commission, December 2000, certain Higher Education Act provisions are unnecessarily restricting the legitimate growth of distance learning, and in turn limiting access (Stedman, 2002). As the reauthorization of HEA progresses, entities involved in eLearning will look to their school systems and states for changes that will make a significant difference based on the needs of eLearners (Salomon, 2004).

Using the ranking criteria from the second survey instrument: (1) Critical, (2) Indispensable, (3) Expendable, or (4) Unnecessary, the three categories of policy, people, and technology proved to have specific needs in each area with overlap among the categorizations by panelists.

The key criteria in the focus area of people began with the following five: (a) focus on student academic needs, (b) engagement between students and the teacher, (c) engagement of curriculum and technology leaders together in the initiative, (d) engagement between students and the content, and (e) professional development to assist teachers in the move from a traditional classroom to practice in a new modality. As with all distance learning opportunities, providing high quality and timely support is of utmost importance (Donlevy, 2003). The criteria that ranked lowest in the second survey instrument in the focus area of people that were not removed from the criteria list also had a mixed focus on student and teacher engagement as well as on access to support. “Engagement” was used pervasively by panelists when discussing criteria for the area of people. Engagement is a term that can be found in educational reform

since Dewey's *Experience in Education* (1938). Panelists commented that, "It is interesting to note that support for teachers ranked considerably higher than support for students," and that, "We might need a formal online teacher certification program."

The key criteria in the focus area of policy began with the following five: (a) establish FTE/ADA funding policies, (b) establish alignment to state/national standards, (c) engage curriculum and technology leaders together in the initiative, (d) professional development to assist teachers in the move from a traditional classroom to practice in a new modality, (e) collaboration with state policy makers. It is important to note that two of these five criteria for policy are also among the top five criteria in the category of people. The two criteria that appear are: engaging curriculum and technology leaders together in the initiative and professional development to assist teachers in the move from a traditional classroom to practice in a new modality. "Policy concerning teacher certification must be addressed and should include seat-time discussions as well as 'ownership' of students" (Rose, 2003, ¶11-13). Leaders in education as well as the field of technology must collaborate on expectations of the delivery model as well as the development of the curriculum. Standards for instructional success for both teachers and students should be so set that they are measurable in order that continuous improvement in eLearning can occur.

Finally, the key criteria in the focus area of technology included the following five criteria: (a) reliability, that is, ensure sufficient redundancy to ensure that failures have no perceptible impact on users and that data integrity remains intact; (b) compliance for special needs student requirements (508, IDEA 1997); (c) student access from school; (d) scalability of LMS, and (e) accommodation of different learning styles online. It is important to note that compliance for special needs student requirements (508, IDEA 1997) appeared in the top five

criteria in the categories of both technology and policy. “Section 508 requires that electronic and information technology is accessible to people with disabilities” (U.S. Dept. of Education, SEC 508). There currently exists no examples of policy that specifically address the online environment that goes beyond the ADA requirements (NCREL, 2004, p. 80). In multiple instances, the key criteria in virtual education programs are stepping outside of existing policy and requiring engagement of leaders in the fields of education and technology to assist in establishing appropriate policy and procedures for this new environment at Grades 9–12. The criteria for technology begin with broad policy statements and progress towards specific technological needs or desires such as 24/7/365 technical support for students, student access from home, and multiple technology methods for engaging and assessing students. Panelists commented that, “Technological tools to assist in data collection and reporting were absent from the report,” and that “reliability of technology is a component, but user-friendly for both students and teachers should be a consideration along with reliability.” Technology is a tool for instruction and in the virtual school environment while its use increases dramatically, the focus of the key criteria is not on technology but on the teaching and learning.

The criteria eliminated from the second survey instrument which had a calculated mean greater than or equal to 2.0 can be discussed in predominantly two areas, the largest of which were the particular component requirements for eLearning courseware. These criteria focused on technology concerns for student information and registration systems, real time responsiveness, resource repositories, meta-data tagging, user ability to redesign interfaces, synchronous communication tools, and integration with eText materials. The area was an extension of policy concerns addressing specific concerns to local and state policy such as the issuance of Carnegie credit, requirements for student participation in State Virtual programs, and parent evaluations of

online programs and online instructors. The elimination of these criteria did not indicate their lack of importance. However the ranking of the criteria helped to address those key criteria that must be established in order to successfully create and maintain a virtual education program in Grades 9–12.

Conclusions

Currently, there are no generally recognized standards, guidelines, policies, or procedures in place for the development, growth, or maintenance of online education programs in Grades 9-12. The purpose of this study was to identify key components of distance education as it relates to web-based course delivery for students in Grades 9-12. The results of the surveys validated the absence of standards, guidelines, policies, and procedures and assisted in pointing the direction in which these could possibly be established. The research was centered on three areas of: *policy, people*, and *technology*. The resulting list of criteria based on the established rank from the panelists included 50 key items considered necessary to establish and maintain a virtual program in Grades 9-12. The research questions were directed to the future of teaching and learning in virtual classrooms. The criteria summarily pointed towards collaboration between education and technology experts. Issues of distance education need researchers, engineers, and participants to work together (Shih et al., 2003). The conversation calling for collaboration is alive in the field of education (Watts, 2003a). Included in these discussions are eLearning criteria for Grades 9-12. This research determined specific criteria to help develop, maintain, or grow an online education program for students in Grades 9-12, addressing a small portion of the technology conversations in the field of education.

Implications for Practice

The findings suggest that there are 50 key criteria necessary to establish or maintain a virtual education program in grades 9-12. The criteria appear to converge about the absence of generally recognized standards, guidelines, policies, or procedures for these programs.

Twenty-four of the 50 key criteria were categorized in the area of policy. Modifying or establishing federal, state and local policies to address virtual education programs within the existing framework for education is suggested. While the majority of criteria were categorized in the area of policy, 13 of the key criteria addressed the category of people. Significant overlap existed between the key criteria that address the category of people and the category of policy. Standards to support, train and evaluate teachers were considered critical by panelists and were categorized by some as policy criteria and by others as criteria that address people in virtual programs.

Finally, the overlap between the category of policy and technology also appear significant with additional overlap between the categories of technology and people. The study suggests that technology is peripheral to the support and training of teachers to meet guidelines and criteria that should be established at the federal, state and local level to address virtual programs in grades 9-12 for the existing educational framework. Keeping pace with the advancement of technology in a virtual environment for resources, reliability and scalability are also suggested as key to establishing and maintaining a virtual program in grades 9-12. However, thought should be given to what is driving the pedagogical and curriculum decisions. Technology advances should not be driving the decisions for teaching and learning, teaching and learning needs should be driving technology advances.

Considerations for virtual education programs in grades 9-12 should include:

- Standards for professional development and support for teachers in virtual education programs.
- Federal legislation, policy, rules and regulations
- State legislation, policy, rules and regulations
- Local School policy and procedures
- Assessing needs for teacher support, training and evaluation to establish standards.
- Collaboration amongst policy makers, educators and technology specialists to develop policies
- Establishing engagement between existing groups in virtual education programs such as:
    - curriculum and technology
    - students and the curriculum
    - students and the teacher
    - students and the facilitator
    - teachers and technology
- Establishing communication with technology specialists in order to provide the opportunity for teaching and learning to drive technology strides in eLearning

Recommendations for Future Study

Should future researchers attempt to replicate this study, it would be wise to attempt other ways to solicit information. Meeting with the panelists for the first and third sessions of the instrument, although expensive, would be one alternative should a funding source be available. A telephone conference or webinar might also have yielded better results. The level of expertise of

panelists in both eLearning and eLearning technologies should be established in the event of future studies. Additionally, in the initial survey it would be advisable to establish a vehicle to clarify responses and/or obtain feedback when combining responses from panelists to create the second survey instrument. The data gathered by this survey instrument became the basis for the key criteria in virtual education programs Grades 9–12. While there are no generally recognized standards, guidelines, policies, or procedures in place for the development, growth, or maintenance of online education programs, future studies should include existing local guidelines and practices.

Identifying and determining a rank order for these criteria provide a general guideline for key criteria in virtual education programs Grades 9-12. However, addressed within the category of people in the initial survey was the idea of the facility. It is recommended that facilities be addressed as an entirely unique topic in order to capture data that includes the impact on the physical structures, technology hardware, as well as student and instructor access to facilities. When replicating this study there is a need to encourage a discussion of impact for facilities and planning if creating a virtual program/school in a district/state. It is also suggested that the criteria category of policy be subdivided in a future study to include legislative policy, that is, state and federal rules and guidelines that are requirements for entities within their boundaries as a separate category than that of local school program policies and procedures.

In the absence of policies specific to the online environment, the ability to establish, monitor, and maintain compliance, while listed as a key criteria, is difficult to define. A future study to investigate ways to establish and monitor compliance is suggested. Additionally, national standards are addressed as a need and a void in technology. Legislative standards are noticed as a need to be addressed in the area of virtual learning environments. A future study to

investigate the application of existing technology standards to the eLearning environment and/or the investigation of locally established technology standards is recommended. A future study in existing legislation addressing eLearning for Grades 9–12 is also recommended. Finally, “engagement” is a term that is used pervasively by panelists when responding to the initial survey instrument and is also found throughout the literature when investigating curriculum delivery, professional development, and student learning styles. A future study to clarify the use of engagement in the various educational contexts, including eLearning, is recommended.

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APPENDIX A

Panelist Information

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APPENDIX B

Initial Survey
The Future of Distance Education:
A Focus on Virtual Programs Grades 9–12

For the following three areas, please list the key components to distance education, specifically the key components to online education for students in grades 9 – 12. The definitions and examples provided are intended to assist participants in the process of brainstorming ideas in the specified areas and are not to be considered complete. There are no incorrect responses however; technical merit and cost are considerations.

Area 1:

Policy: Those legislative and educational policies that directly or indirectly influence the process of implementing, funding and maintaining an online educational program for students in grades 9 -12. [Ex: Legislative (Federal, State and local) NCLB, Higher Education Act of 1998, ADA etc., Educational (State and local district policies/procedures)]

Area 2 - 4:

People: Those directly or indirectly impacted by online education programs for students in grades 9 – 12. [Ex. Professional development and education of faculty, staff, students, parents, community members, Impact to teaching and learning, facilities and per pupil cost considerations]

Students:

Faculty/Staff:

Facilities:

Area 5 -7:

Technology: The technology necessary to create, deliver and monitor online education programs for students in grades 9 – 12. [Ex. User technology requirements, administrative technology requirements, teacher technology requirements, outsource maintenance and technical support, SCORM compliance, learning objects, repositories]

Students:

Faculty/Staff:

Courseware/Delivery System:

APPENDIX C

Second Survey
The Future of Distance Education:
A Focus on Virtual Programs Grades 9–12

This instrument is a direct result of the initial survey. All criteria solicited through the initial instrument will be categorized and listed in no particular order. Participants will then be asked to rank the criteria on the second instrument, the panel ranks it as 1 (critical), 2 (indispensable), 3 (expendable), 4 (unnecessary). Each panelist ranks the list individually and anonymously. Upon receipt the researcher will calculate the mean and deviation. Items in the list will be removed which have a calculated mean greater than or equal to 2.0. The criteria are then placed in rank order and shown to the panel (anonymously). Possible reasons for items with high standard deviations are noted.

1. Establish FTE/ADA funding policies
2. Establish alignment to state/national standards
3. Technology standards for virtual learning environments at high school and grade k - 8
4. Establish alignment to high-stakes tests
5. Ability to demonstrate improvement in student achievement, for all students (broken out by subgroup)
6. Examine ‘seat time’ equivalency policies for virtual learning environments
7. Policies concerning the issuance of Carnegie credit
8. Standards for evaluation of course content
9. Standards for evaluation of teachers in a virtual learning environment
10. Establish certification program for teaching in a virtual environment (similar to TSS or Gifted in-field add-on certifications)
11. Establish consistent data measures for student learning across virtual programs
12. Examine policies presently in place that may serve as barriers to the development and full use of online learning

13. Establish a protocol for continual feedback to policy makers regarding costs to ensure adequate funding

14. Establish policy **requiring** participation in the State Virtual High School as an alternative for students when courses are not otherwise available

15. Research into the efficacy of electronic education at the high school and k-8 level

16. Educational Portal

17. Student Registration System

18. Course repositories separate from the course creation/management software

19. Independent course authoring systems that also classify learning content

20. Ability to redesign user interfaces of courseware products for different users

21. Ability to integrate textbook content or assessments into courseware products

22. System to catalogue, search, and name courses/ resources that is generally accepted

23. Ability to license certain courseware products on a statewide basis

24. Resource repository

25. Engage curriculum and technology leaders together in the initiative

26. Involve education community at the local and state level in the initiative

27. Scalability of personnel

28. Scalability of LMS

29. Collaboration with private sector

30. Collaboration with education community

31. Collaboration with state policy makers

32. Establish support and monitoring of online instructors

33. Focus on student academic needs

34. Establish methods for frequent feedback to student participants in a virtual learning environment

35. On site facilitator access for students participating in a virtual learning environment

36. Student orientation to online learning environment and necessary technical skills prior to participation

37. Access to electronic resources to assist with instruction: textbooks, special software, audio, video

38. Student evaluation of online program and course of study

39. Teacher evaluation of online program

40. Needs assessment for students/system and/or state

41. Establish best practices for teachers

42. Collaboration with other online teachers for resources and sharing

43. Mentors for teachers new to virtual learning environment

44. Teacher retention data for virtual learning environment

45. Student success data for virtual learning environment

46. Accommodation of different learning styles online

47. Parent evaluation of online program and teacher

48. Student Information System

49. Grading Program

50. Course Management System

51. Synchronous communication tools

52. Asynchronous communication tools

53. Assessment building tools

54. 24/7/365 Technical support for students

55. 24/7/365 Technical support for teachers

56. Engagement between students and the content

57. Engagement between students and the teacher

58. Engagement between students and each other

59. Professional development to assist teachers in the move from a traditional classroom to practice in a new modality

60. Multiple technology methods for student engagement

61. Open standards course delivery system

62. Compliance for special needs student requirements (508, IDEA 1997)

63. Student access from home

64. Student access from school

65. Internet Acceptable Use Policy for students

66. Internet Acceptable Use Policy for teachers

67. Sharable Content Object Reference Model (SCORM) Compliance

68. Learning Object Repository (L. O. R.)

69. Real time responsiveness

70. An underlying infrastructure to provide high performance data access, with real-time replication rather than scheduled backup processes

71. Software scalability – a software architecture that enables applications to grow without limitations

72. Reliability: ensure sufficient redundancy to ensure that failures have no perceptible impact on users and that data integrity remains intact

73. Security: prevention of service interruption resulting from infection with viruses, etc., -- ensuring that services are not disrupted and privacy is not violated by hacking or malware

APPENDIX D

Third Survey
The Future of Distance Education:
A Focus on Virtual Programs Grades 9–12

This instrument is a direct result of the second survey. All criteria ranked through the second instrument will be categorized and listed in rank order. Participants will then be shown the criteria on the third instrument. Possible reasons for items with high standard deviations were noted. Each panelist reviews the list individually and anonymously. Panelists will then be asked to order, modify, and/or add to the initial responses based upon their review of other members' ideas. Upon receipt the researcher will analyze the results and provide feedback to panel. Items which had a calculated mean greater than or equal to 2.0 and a standard deviation of less than .75 were considered to have consensus. Re-inserted items in the list and qualitative comments from panel members are included in the analysis.

APPENDIX E

Ranked Criteria – Results from Second Survey Instrument

Survey Question #	Survey Question	AVG. (out of 4 possible max)	STD. Dev.
33	Focus on student academic needs	1.3333	0.4714
57	Engagement between students and the teacher	1.3333	0.4714
1	Establish FTE/ADA funding policies	1.3333	0.5774
2	Establish alignment to state/national standards	1.4444	0.6849
25	Engage curriculum and technology leaders together in the initiative	1.5	0.6009
56	Engagement between students and the content	1.5	0.6009
59	Professional development to assist teachers in the move from a traditional classroom to practice in a new modality	1.5	0.6009
31	Collaboration with state policy makers	1.5556	0.5984
41	Establish best practices for teachers	1.5556	0.6849
45	Student success data for virtual learning environment	1.6111	0.4875
30	Collaboration with education community	1.6111	0.5906
32	Establish support and monitoring of online instructors	1.6111	0.5906
72	Reliability: ensure sufficient redundancy to ensure that failures have no perceptible impact on users and that data integrity remains intact	1.6111	0.5906
9	Standards for evaluation of teachers in a virtual learning environment	1.6111	0.6781
27	Scalability of personnel	1.6111	0.6781
26	Involve education community at the local and state level in the initiative	1.6667	0.4714
62	Compliance for special needs student requirements (508, IDEA 1997)	1.6667	0.5774
64	Student access from school	1.6667	0.5774
28	Scalability of LMS	1.6667	0.6667
34	Establish methods for frequent feedback to student participants in a virtual learning environment	1.6667	0.7454

43	Mentors for teachers new to virtual learning environment	1.6667	0.7454
5	Ability to demonstrate improvement in student achievement, for all students (broken out by subgroup)	1.7222	0.5583
39	Teacher evaluation of online program	1.7222	0.5583
38	Student evaluation of online program and course of study	1.7778	0.5329
46	Accommodation of different learning styles online	1.7778	0.5329
8	Standards for evaluation of course content	1.7778	0.6285
40	Needs assessment for students/system and/or state	1.7778	0.6285
42	Collaboration with other online teachers for resources and sharing	1.7778	0.6285
58	Engagement between students and each other	1.7778	0.7115
4	Establish alignment to high-stakes tests	1.8333	0.6009
37	Access to electronic resources to assist with instruction: textbooks, special software, audio, video	1.8333	0.6872
50	Course Management System	1.8333	0.6872
6	Examine ‘seat time’ equivalency policies for virtual learning environments	1.8889	0.6573
35	On site facilitator access for students participating in a virtual learning environment	1.8889	0.737
54	24/7/365 Technical support for students	1.8889	0.737
63	Student access from home	1.9444	0.6211
3	Technology standards for virtual learning environments at high school and grade k - 8	1.9444	0.7049
53	Assessment building tools	1.9444	0.7049
60	Multiple technology methods for student engagement	1.9444	0.7049