

Critical Success Factors for Deploying Distance Education Technologies

Implications for Practitioner Organizations, Vendors, and Service Providers

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Critical Success Factors for Deploying Distance Education Technologies in the Classroom
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Executive Summary

This white paper builds on research conducted in the Spring of 2009 designed to measure videoconferencing adoption in United States primary and secondary schools. That research led to [*The 2009 Update: Taking the Wraps off Videoconferencing in the U.S. Classroom*](#). Among the findings not fully discussed in *The 2009 Update* white paper are the obstacles to successful deployments and the success factors that help overcome those obstacles. Without a programmatic understanding of best practices and methods of anticipating potential roadblocks, far too many initiatives may falter or fail. Thus this white paper attempts to codify recommendations designed to support overcoming obstacles – and offers specific recommendations to three major constituents within the ecosystem of distance education: 1) educators and their organizations; 2) vendors and service providers who make products used for distance education; and 3) policymakers.

We know that distance education can be invaluable to learners, educators, and educational institutions alike. We also know that many successful programs are run throughout the U.S. and elsewhere in the world. We see momentum in all things related to distance education. The pace of change is speeding up, partly due to technological innovation, partly to newly perceived value, partly to timing and need, and partly as a result of learner expectations and expressed desires. Competition with other institutions of learning is fast approaching as well. This rapid rate of change makes it imperative that educational organizations plan properly to avoid roadblocks.

Understanding that often the applications (and benefits) of distance education technologies evolve over time helps organizations properly strategize for success. Two factors are cited most as the major obstacles to successful distance education: 1) lack of bandwidth and technology infrastructure or old equipment; and 2) staffing. Other obstacles, such as lack of educator interest, funding challenges, and lack of policy and champions, are also important obstacles that can, fortunately, be overcome.

Specific steps can be taken to empower stakeholders in ways that will lead to successful distance education programs. As of 2009 Wainhouse Research believes that the only limiting factor to distance education is not the availability of high quality, superior technologies, but instead regionally based bandwidth issues, educator training, and learner expectation setting.

Overview

This white paper builds on research conducted in the Spring of 2009 designed to measure videoconferencing adoption in United States primary and secondary schools. That research led to [*The 2009 Update: Taking the Wraps off Videoconferencing in the U.S. Classroom*](#), which focuses specifically on videoconferencing adoption rates on a state by state basis, satisfaction rates, and whether or not interactive videoconferencing in the classroom¹ is helping educators achieve academic goals they have set for their learners.

Among the findings not fully discussed in *The 2009 Update* white paper are the obstacles to successful deployments and the success factors that help overcome those obstacles. Technologies like electronic whiteboards, lecture capture, streaming video, learning management systems, videoconferencing, and web conferencing are increasingly finding their way into the classroom and onto the desktops of educators and learners. Millions of dollars have been and will be spent on bandwidth and technology initiatives, often with federal and/or state funding sources, occasionally with corporate sponsorships. Many states have received court orders or have mandated legislatively to provide distance education programs as a matter of equity of access. And many states in the U.S. are developing virtual schools to support non-traditional or special needs learners as well as to reduce the need for new buildings; many of these virtual schools are utilizing some of these technologies to support hundreds and in some cases thousands of learners. Yet without a programmatic understanding of best practices and methods of anticipating potential roadblocks, far too many initiatives may falter or fail.

Methodology

Building upon work first conducted in 2006 by Wainhouse Research, in the Spring of 2009 we collaborated with staff members of the Center for Interactive Learning and Collaboration (www.cilc.org), who contacted individuals in state departments of education, educational technology networks, and large urban/county school districts for in-depth interviews (IDI's). These IDI's concerned deployments, applications, uses of videoconferencing and ancillary distance education technologies, obstacles and success factors, and drivers of adoption. These interviews were conducted with one or more knowledgeable individuals in a total of 49 states out of 51 entities tracked (including District of Columbia). This white paper combines data gathered from the interviews with Wainhouse Research's accumulated knowledge concerning what makes distance education deployments successful.

¹ Classroom-based videoconferencing typically consists of group systems (monitors, codecs, audio equipment, user interface devices) designed for groups of learners in a classroom.

The Successful Distance Education Program

Every distance education program has its own criteria for success. Some rules of thumb for what comprises a successful distance education program – as opposed to one that fails to meet success standards – are:

- Clear cut problems are being addressed
 - Teacher shortages in rural areas where it is hard to recruit or where class sizes do not support highly qualified teachers.
 - Advancement opportunities are offered
 - Foreign languages and other specialized courses of study are made available
 - Electives and vocational education
 - Classes are being enriched through external content and collaborative programs.
 - Professional development is delivered, resulting in improved quality of life and teacher productivity combined with efforts to match initiatives for district or campus improvements
 - Specific initiatives exist to deliver specific content (math, sciences, social studies, English)
 - Credit recovery opportunities are made available
- Utilization rates and enrollments are stable and grow over time.²
- Metrics exist – not simply of utilization rates, but of programs, outcomes, and benefits. This means constant monitoring of learner and teacher attitudes.
- Sufficient numbers of educators are trained and aware of services available and the economics and value of delivering or receiving content over distance.
- Alternative uses, such as professional development or administrative applications, are identified and become commonplace and well accepted.
- Criteria for effective teaching (via distance education) are well developed and understood.
- A sustainable business model exists that ensures essential funding sources remain available (far too many programs have ended because grant funding can go away).
- The technologies support learning and interactions, and feel comfortable and easy to use to learners, educators, and administrators.
- Supporting technologies are kept up to date.
- Programs utilize hybrid or blended models of communication to support classroom synergies.

² Wainhouse Research cautions, however, that utilization rates should be used as a metric with a caveat. The numbers of hours of usage are less important than numbers of learners served, programs offered, and initiatives met. Nonetheless, vibrant programs with classroom technologies like whiteboards, videoconferencing, and streaming servers do in fact often utilize their equipment 8 to 12 or more hours per day on a regular basis.

Why This Discussion Matters

We know that distance education can be invaluable to learners, educators, and educational institutions alike. Two important studies we analyze in greater detail in [Mapping the Sea of Research into Video-Based Distance Education](#) are important to mention here:

- The [U.S. Department of Education](#) announced in June 2009 that it had conducted its own meta-study and identified 46 research studies that met the very high bar for quality that was required for its analysis. For the first time ever, an impartial stakeholder has asserted that “blended” instruction (using a variety of face-to-face and distance-oriented pedagogical methods) can have a larger advantage relative to purely face to face instruction or instruction conducted wholly online.
- In a Sloan Consortium survey of U.S. primary and secondary educators, as of the end of 2008 75% of respondents had one or more students enrolled in a fully online or blended course. Respondents reported that online learning is meeting the specific needs of a range of learners, from those who need extra help and credit recovery to those who want to take Advanced Placement and college-level courses. Concerns about course quality were less of a factor in 2007-2008 than in a previous survey, whereas issues regarding course development and/or purchasing costs, and limited technological infrastructure to support distance education, were moderately or significantly increased in the latest survey. Put simply, concerns about the ability of online courses to meet quality standards seem to be receding while concerns about the ability to actually deliver online classes (development and infrastructure) are growing.

For the first time ever, an impartial stakeholder has asserted that “blended” instruction (using a variety of face-to-face and distance-oriented pedagogical methods) had a larger advantage relative to purely face to face instruction or instruction conducted wholly online.

Why is this important? For two reasons. First, it shows the momentum in all things related to distance education. The pace of change is speeding up, partly due to technological innovation, partly to newly perceived value, partly to timing and need, and partly as a result of learner expectations and expressed desires. Competition is another driver, one that will alter the look of **Figure 1** within a very short time. With the increasing amounts of online and blended learning occurring, change is coming so quickly it may come faster than educators can absorb.

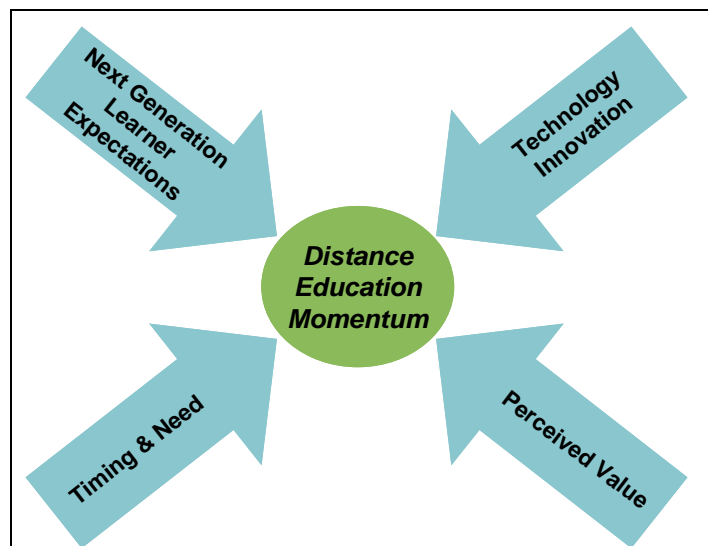


Figure 1 Drivers Leading to Momentum for Distance Education

A May 2009 survey of almost 200 videoconferencing users conducted by Wainhouse Research for TANDBERG determined that use of videoconferencing, video streaming, web-based online courses or content, web conferencing, Course Management Systems, web cam applications, and simulation software/games is likely to increase significantly by 2011. Figure 2 illustrates expectations using a weighted scale of High=3, Medium=2, and Some=1.³

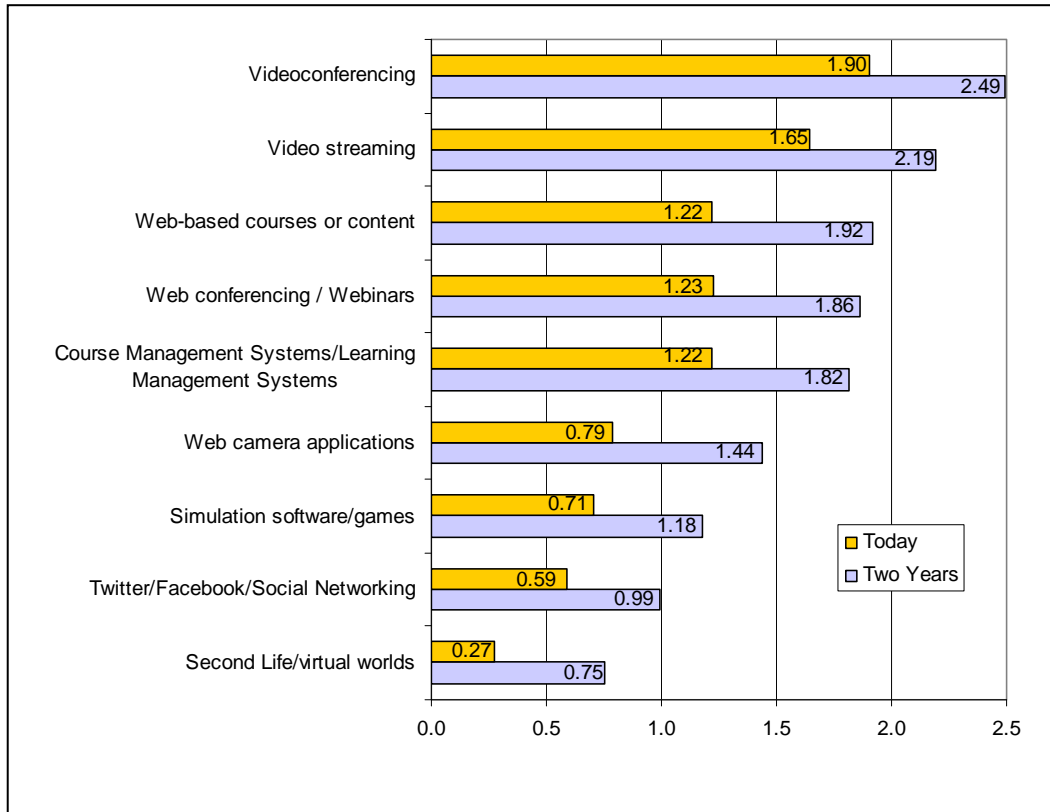


Figure 2 Technology Use 2009 and Expectations for 2011

That same survey determined that a robust set of applications exist for videoconferencing in the classroom today, from classroom enrichment and collaborative projects to professional development and course delivery, and from administrative purposes to learner content creation. In fact, often the applications (and benefits) evolve over time, as shown in Figure 3.

³ TANDBERG Education Video Guide, 2009.

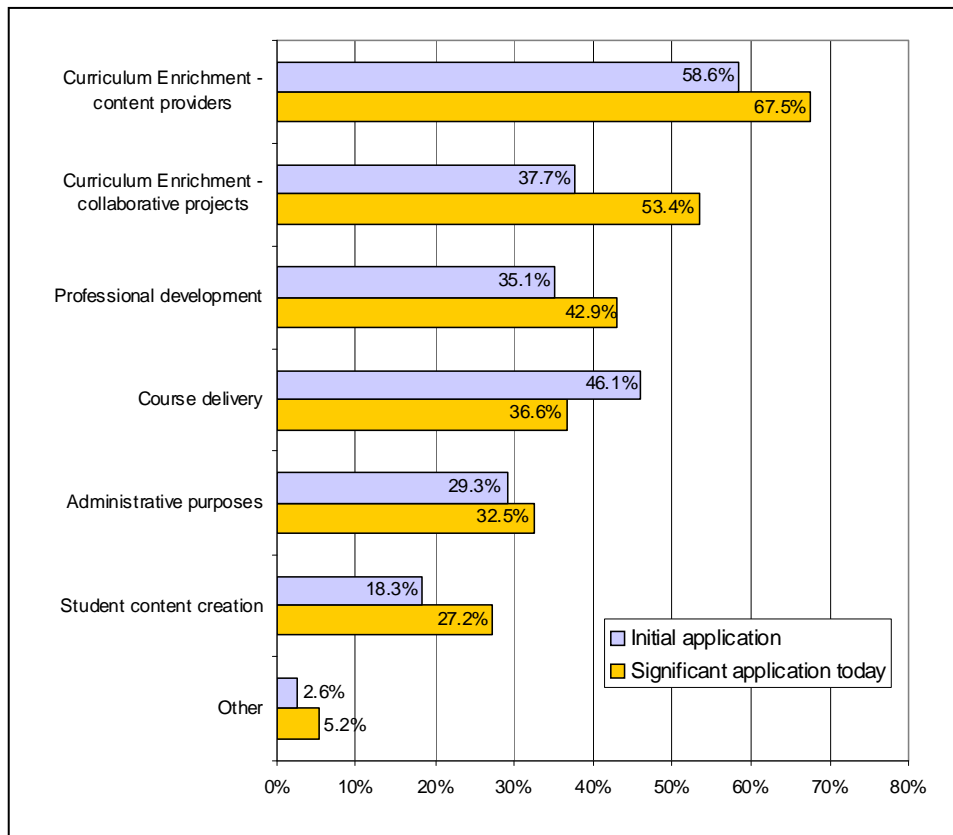


Figure 3 Initial and Today's Applications for Videoconferencing in Education

Research conducted Spring 2009 by Wainhouse Research and CILC determined that of 40 respondents who felt they could speak for their *states* on the question of satisfaction with utilization of and applications for videoconferencing, one in four (25%) indicated they were fully satisfied. Another 25% indicated a mixed, “yes and no.” And 50% indicated they were not satisfied and felt that more could be done to achieve successful implementations. Another way to look at this data: some degree of satisfaction and accomplishment is being reached in about half the states, but work could be done in three out of four states on implementing success factors to either turn things around or simply build on relatively successful deployments. All of this is true even though 80% of the interviewees stated that interactive videoconferencing (the technology under discussion in those interviews) is helping schools, districts, and states address their academic goals.⁴

The ingredients of a successful program do not call for rocket science. They simply call for an understanding of best practices and ways of overcoming the roadblocks to success. The following sections describe those roadblocks and hurdles, and ways of overcoming them.

⁴ Wainhouse Research, [The 2009 Update: Taking the Wraps off Videoconferencing in the U.S. Classroom](#), 2009.

Roadblocks and Hurdles

The 2009 Update: Taking the Wraps off Videoconferencing in the U.S. Classroom identifies states with the greatest adoption rates based on classroom system counts (most notably California, Texas, New York, Florida, and Michigan), states with the greatest new initiatives that are promising (like Alabama, West Virginia, and Arkansas), and states that appear to be lagging in adoption. Some states have struggled to grow their distance education services and programs as a result of several factors: lack of statewide infrastructure initiatives (bandwidth, especially in rural areas), lack of policy/leadership for distance education technologies at the state level, lack of an outreach sensibility,⁵ lack of buy in at school level, and perhaps competing sub-networks that never found a particularly compelling reason to cooperate and grow or exchange applications and content. The proverbial “last mile” challenge – the inability to extend sufficient network bandwidth all the way to campuses and into classrooms – is especially big among primary and secondary education users.

We are satisfied with the utilization rates. The systems were put in for the opportunity of increasing equity among students. The number of students utilizing the system has grown from 61 in 2001 to over 14,000 in 2008...incredible growth. – State Coordinator of K-12 Distance Learning

For this survey update we asked the respondents to identify the hurdles and roadblocks their states have faced in deploying classroom-based videoconferencing. Table 1 groups together the most cited obstacles to videoconferencing deployments. (Note that a number of cited obstacles tied one another.) We happen to believe that these obstacles, cited in interviews as obstacles to successful videoconferencing initiatives, can be generalized to a discussion of distance education in general. Other than certain less-bandwidth-sensitive technologies (social networking, for instance), most of the major distance education technologies are sensitive to the same factors as videoconferencing.

Obstacle	Ranking
Lack of bandwidth and technology infrastructure, or old equipment	1
Staffing (inability to afford support personnel)	2
Lack of interest on the part of sufficient educators and administrators	2
Funding challenges	2
No statewide or district-wide policy / standards / champions	5
Firewalls	6
Resistance to change	7
Bell schedules / calendars	8
Costs	8
Learning curve	8
The need to create awareness of availability / value	8

⁵ The understanding of the importance or value of creating connections to remote or external educators and learners.

Obstacle	Ranking
Lack of dedicated rooms or not enough equipment	12
Focus on testing / NCLB	12
The technology was not perceived as high enough quality initially	12
The state is in the early stages of deployment	12

Table 1 Rank Order of Obstacles to Successful Deployments

Bandwidth availability varies widely state to state, as does the availability of new or updated technologies. Some state departments of education champion bandwidth and accessibility at a statewide level, often through regional educational service centers (RESCs) or Boards of Cooperative Educational Services (BOCES); some leave it to local districts to handle bandwidth and technologies. Two major consequences occur when bandwidth and technologies are subpar:

1. Educators attempt to develop distance education programs, but they are rejected because the quality of experience is lacking – which only results in disappointed practitioners and learners who never return to distance education.
2. Programs are eliminated but the equipment and technologies remain visible as reminders of those failures – preventing the healthy evolution of distance education and adoption of even newer technologies.

Often programs struggle because of the inability to afford support personnel – a simple obstacle, one would think, yet a factor not always considered in the planning stages – or because of general funding challenges. Tied with these two obstacles for second ranking is a lack of interest on the part of sufficient educators and administrators – an obstacle we address later in this white paper. Some educators are simply unaware of the possibilities afforded by distance education; others are preoccupied with “teaching to the test,” as it were. (We have seen some principals who ignore opportunities to take advantage of state- or grant-funded distance education technologies if they lack awareness of the value and possibilities or fear losing headcount that might affect their daily learner funds from their state). Even though forces like lawsuits and legislative action work to promote distance education in some states, at a practical level educators must be interested and willing to try the supporting technologies – or programs fail. This often may be the result of a lack of policy at the statewide or district-wide level, which is the fifth most cited obstacle, and one we have seen to be a major hurdle in many of the lagging states. Or it may be the result of a lack of program content or ignorance about where to find that content, not cited as a factor in Table 1 but a major reason some large statewide distance education networks have withered away.

(It's) not used enough Seems to be hard to understand by folks and they struggle utilizing it. It seems more complicated to them. The state provides grants for equipment but not for program development. We are beginning a process to bring on museums – Education Technology Specialist, Regional Consortium

In the primary and secondary educational market, differing bell schedules are a critical factor because they can prevent schools from collaborating with one another using real-time technologies, whether a

county away or a state away. Bell schedules also can hinder reception of courses and professional development services from community colleges and universities that have their own systems and calendars for scheduling. Often bell schedules are written in stone based on regional preferences and extracurricular activities such as athletics, and getting schedules aligned can be a highly challenging, if not impossible, task. But some states, such as Arkansas, have indeed successfully calibrated bell schedules and calendars. It can be done.

Finally, one barrier can result, ironically, from successful initiatives. When classroom distance education technologies are in full use, opportunities for spontaneous, ad hoc events or professional development activities can be severely curtailed due to limited capacity. This issue points to the perception of lack of scalability and an inability to evolve applications without additional capacity expansion.

Classes can clog use, believe it or not. If equipment is used for classes all day, there is no access for additional opportunities – Manager, Statewide Educational Telecommunications Network

Critical Success Factors

The convergence of technological innovation and need are likely to run head-on into another factor: lack of preparedness. With the pace of change quickening, institutions will be pressed to deploy technologies without proper planning and best practices in play, and some institutions will fail time and again unless they have the proper ingredients to ensure success. Thus Wainhouse Research offers a series of recommendations contained in Table 2 to those organizations attempting to succeed in distance education, and another set contained in Table 3 to those who can help them most: the vendors and service providers responsible for the technologies being introduced to deliver distance education. We then offer some general policy ideas for the federal level.

Wainhouse Research believes that the only limiting factor to distance education is not the availability of high quality, superior technologies, but instead regionally based bandwidth issues, educator training, and learner expectation setting.⁶

Educator/Organizational Success Factors

Obstacle	Recommendation to End User Organizations
Lack of bandwidth and technology infrastructure, or old equipment	It goes without saying that inadequate bandwidth and equipment are the single biggest set of obstacles and must be addressed for program success. Organizations <i>must</i> include funding models that take into account the need for technology refreshes every three to five years. Bandwidth is a separate issue, one even more complex, but WR recommends planned over-provisioning (when possible) as a means of ensuring healthy growth. Budgeting cycles need to reflect this requirement. We have seen many deployments of videoconferencing and web conferencing fail due to lack of sufficient bandwidth. Deployment strategies should be composed with five year time horizons and revised periodically.
Staffing (inability to afford support personnel)	WR believes that many of today's technologies are user-friendly enough to warrant operation by educators and learners, but IT personnel are a requirement for maintenance and support <i>and</i> instructional designers are <i>mandatory</i> . Any grants applications should include funding for support personnel or for ongoing reseller/service provider support.
Lack of interest on the part of sufficient educators and administrators	Often lack of interest can be countered by effective marketing – and identification of campus-based champions. This means regularly scheduled events and training sessions, and use of case studies and academic research. It also means those responsible for initiatives, e.g., distance education directors, must examine and hold accountable <i>content</i> components of their programs (good content both captures the imagination of educators – and empowers them to be better online teachers). For statewide consortia and departments of education, it means regular outreach and evangelizing – and creating metrics that track outreach effectiveness.

⁶ By learner expectation setting, we refer to properly informing learners about what to expect as a distance learner, and teaching them how to behave as learners to get the most out of their courses of study.

Obstacle	Recommendation to End User Organizations
Funding challenges	Funding is an issue in any educational setting. Past research we have conducted has shown that more than 1/3 of school districts <i>do not</i> maintain grants writers on staff – and many only rarely if at all use external resources. Thus often grants applications are written by novice educators, and then are rejected due to lack of grant writing experience. Many vendors and service providers have staff available to support the grants process, and districts should utilize these resources. For statewide consortia and departments of education, WR recommends regular review of distance education grants processes to ensure that they are easily completed, meet educator needs, and are distributed in sufficient quantities to make a difference. In this age of fluctuating energy prices, districts also can look at re-allocation of traditional expenses, e.g., transportation costs.
No statewide or district-wide policy / standards / champions	In a perfect world, every school, district, or state would have champions who understand the technologies and policies necessary to enable distance education. At a grass-roots level these are formed through support and self-selection: individuals who are good at and like educational technologies tend to excel at promoting them. But states need policy, funding, and often legislative or judicial action to promote or mandate distance education. Any state lacking such leadership “from the top” should closely examine ways of taking leadership to the next level. This is often a matter of revising / rethinking existing strategies – and adopting new ones to constantly changing conditions.
Bell schedules / calendars	Bell schedule and calendar alignment are primarily a political matter, requiring significant leadership and political capital to accomplish. Typically these can best be achieved through two means: 1) Beginning small, perhaps with blocs of time put into alignment instead of a full school day, for instance; and 2) through sets of incentives that make it beneficial to a district, system, or school to accommodate schedule alignment.
Cost justification	We interpret the obstacle of “cost justification” differently from the issue of funding. Funding relates to how to find the money, whereas cost justification relates to the perception that technology does not provide the benefits and return on investment to justify deployment and implementation. This perception requires addressing the need for cost vs. payback, an area with which many organizations struggle. Yet WR has seen time and again in educator surveys that administrative applications often are the “surprise” benefit, often showing the greatest amount of growth over time. Planning for such applications may help many end user organizations cost justify deployment of distance education technologies, because savings in productivity and travel budgets can easily quickly help organizations meet their fiscal goals. Similarly, pricing models offered by vendors and service providers more often show flexibility these days based on licensed seats or unlimited usage models; the more you buy, the less you pay per user.
Learning curve	Distance education technologies require training today and tomorrow. Technologies should be selected based on their ability to 1) meet application needs; 2) be sustainable over time; 3) be easy to use; and 4) be easily updated. Having said that, this suggests that vendors and service providers can do more to support users (discussed in the following section).

Obstacle	Recommendation to End User Organizations
The need to create awareness of availability / value	Wainhouse Research often suggests to end users that pilots are an effective method of trialing – and promoting – new technological deployments. Besides that benefit, pilots can be used <i>in a calculated fashion</i> to push the value – as long as they are successful. We recommend selecting early adopters who are willing to embrace technology and also willing to show patience as early kinks get worked out. While this may seem obvious, the value is in avoiding political “blowback” should any early kinks be significant.
Lack of dedicated rooms or not enough equipment	Neither new classrooms nor added collaboration technologies can typically happen overnight. But we encourage distance education planners to think carefully about ways in which collaborative technologies can be scaled and introduced more quickly than they perhaps have been accustomed to believing was possible. First, web conferencing has become an easily scalable technology. All that is needed is a desktop PC and Voice over IP (VoIP) or telephone line – two of the more ubiquitous technologies available today. Videoconferencing and on demand streaming video are more complicated to deploy, yet tools like mobile videoconferencing units, new desktop videoconferencing solutions, streaming video, and lecture capture technologies offer a similar scalability, as they may draw on ubiquitous technologies (PC’s) to be deployed. Academics now can teach from anywhere, so the question becomes not how to place these tools into the hands of educators, but how to find and properly train educators who will be comfortable teaching over distance. The mix of technologies and trained educators can clearly help minimize the need for new dedicated classroom spaces.
Focus on testing / NCLB	The No Child Left Behind Act has made an impact on primary and secondary schools in the U.S. like no other in years. Yet no educational legislation has been more controversial since school integration became an issue more than 50 years ago. While educators remain focused on testing, which can be short term in its time horizon but lasting in its impact on the fate of a school (if results are poor), WR believes that collaborative and online learning can actually address poor performing or non-traditional learners who may be struggling precisely because they need individual attention and motivation that the combination of caring teachers and innovative technologies can provide. Thus we encourage schools to examine how using distance learning technologies – some of which can also help assessment processes – may contribute to the challenges of “teaching to the test.” (A vast amount of on-demand and real-time content is now available to support learning activities.)
The technology was not perceived as high enough quality initially	Perceptions change only over time. Sometimes it requires a shift in delivery media, such as High Definition (HD) for videoconferencing, or introduction of feature sets, such as audience polling, testing, and mood indicator features in web conferencing. As of 2009 Wainhouse Research believes that the only limiting factor to distance education is not the availability of high quality, superior technologies, but instead regionally based bandwidth issues, educator training, and learner expectation setting.

Table 2 Educator/Organizational Success Factors

Vendor/Service Provider Success Factors

Wainhouse Research offers here suggestions to vendors and service providers for ways to address end user headaches and foster adoption. Many of these recommendations are based on the knowledge that the savvy vendor or service provider with a focus on practitioners can implement them, and with the expectation that many vendors and service providers will not simply because they fail to see the opportunity. Those who fail to see this opportunity will miss a chance at millions of dollars in sales of software, hardware, and services – and at playing a role in the transformation of educational processes as schools gear up in the coming decade to educate in entirely new ways.

Obstacle	Recommendation to Vendors/Service Providers
Lack of bandwidth and technology infrastructure, or old equipment	Buyback and trade-in programs are well known to be an effective way to replace antiquated technologies with the latest and greatest. Not so well understood is that vendors themselves are in the position to support end user organizations even more when they focus marketing efforts on customer relationship management. Some vendors (typically those that require reseller/integrator installation and support) long have complained that channels prevent them from knowing their end user customers; WR believes that in today's universe of socially networked, Facebooked, Linked in, twittering end user communities and new models for customer relationships established by the Internet, any vendor that does not engage in aggressive end user discovery, retention, and support will over the long term miss many opportunities. This means vendors must overcome the traditional reseller reluctance to enable vendor-end user relationships by creating support programs that do not conflict with reseller support activities. Those vendors that find their customers – and hold onto them through innovative marketing programs and support e.g., grant writing, equipment trade-ins, and clever software licensing schemes – will find long term success.
Staffing (inability to afford support personnel)	Vendors should offer real-time monitoring and reporting tools in various layers and configurations, so that different types of staff (novice, power user, technician) can support a technology deployment depending upon the needs of the organization. Vendors today also use far too few simulations and online training tools, which would go a long way in improving end user knowledge and abilities to trouble shoot without adding significant costs. This should be coupled with affordable reseller or service provider support and training.
Lack of interest on the part of sufficient educators and administrators	Often lack of interest can be countered by effective marketing. Some vendors already do a strong job finding champions, funding research, promoting best practices, and enabling end user organizations to succeed. Others simply sell the technology and walk away. If you intend to focus on the educational user – and even corporate trainer – you must work to help other educators understand the value and payback possible with distance education technologies.
Funding challenges	As stated earlier, many school districts <i>do not</i> maintain grant writers on staff – and many only rarely if at all use external resources like freelance grant writers. Customer-centric resellers and vendors alike offer their own grant writers on staff; if your company is not in a position to do so, it can still foster grant writing by establishing a relationship with one of the regional or national firms that specialize in educational grant writing – and positioning this external resource to support end user funding needs.

Obstacle	Recommendation to Vendors/Service Providers
No statewide or district-wide policy / standards / champions	Few vendors and service providers other than the leaders in their fields (Cisco, Alcatel-Lucent, AT&T, Polycom, SMART Technologies, and TANDBERG) are in a position to influence policy (which can range from technological standards to educational policy standards). Yet even smaller companies can support the climate for distance educational technologies by doing one thing: hiring savvy sales and business development managers out of the educator profession and using them to sell into education. Many teachers look for second careers when they leave the classroom, either going into administration or leaving the profession. This type of individual – if properly identified and hired – should have as part of his or her job involvement with regional consortia, state planning committees, and standards bodies.
Costs	Pricing models offered by vendors and service providers more often show flexibility these days based on licensed seats or unlimited usage models; the more you buy, the less you pay per user. The days of per minute or per megabyte charges for services are long gone. For equipment providers, the trick will be to begin methods of delivering educational pricing that sharply veer away from traditional hardware models. This may call for more managed services where the vendor continues to own the product but runs it for the end user (and guarantees equipment refreshes), or for scenarios where flexible tiered pricing models kick in to actually promote viral use. (Vendors and service providers typically charge <i>less</i> per unit of consumption to customers who use more of a technology.)
Learning curve	As stated earlier, vendors and service providers have a long way to go in making training ubiquitous and self-serve. This is one reason their offerings fail to scale; often they provide live training, or outsource that live training to third parties, but that event-driven training fails to “stick.” Additionally, real-time training is only one component of the process of enabling educators and learners to use distance educational technologies. Offering simulations, games, and context-sensitive <i>on-demand</i> trainings are a clear cut way to support increased scaling and mainstreamed use of these technologies.
The need to create awareness of availability / value	Vendors and service providers are in a unique position to create awareness because they see the big picture and are delivering technologies in use already. Thus they also are in the position to formalize data capture (end user success stories, reference accounts, and funded research). These should be programmatically gathered and treated with kid gloves, used primarily to help market and foster adoption (not just to be able to sell more to these customers). Supporting regional and statewide conferences – and their end user evangelists – are other ways of creating awareness of value. Those vendor organizations that do this – the truly customer-facing organizations – are the ones end users will increasingly find attractive.

Obstacle	Recommendation to Vendors/Service Providers
Lack of dedicated rooms or not enough equipment	This is a difficult obstacle to tackle because the vendor or service provider can only do so much to support end users. Giving away equipment is not the answer. But Wainhouse Research believes that developing and promoting technologies and teaching models that include greater use of distributed processes (classroom-to-PC and PC-to-PC) and on demand learning content integrated with real-time teaching models will be the key for adoption in education in the next decade. Vendors that build or partner for integrated solutions will be in the best position to capitalize on the evolution of distance education.
Focus on testing / NCLB	Just as we encourage schools to examine how using distance learning technologies can contribute to the challenges of “teaching to the test,” we encourage vendors to examine ways in which their technologies can support ongoing assessment needs. Certain vendors have done an excellent job of packaging content for educators (which in turn drives use of their technologies). More can be done in this area, however.
The technology was not perceived as high enough quality initially	As of 2009 Wainhouse Research believes that the only limiting factor to distance education is not the availability of high quality, superior technologies, but instead regionally based bandwidth issues, educator training, and learner expectation setting. On rare occasion we have seen “bait-and-switch” techniques used by some resellers that trial a technology at one bandwidth, for instance, and then drop the throttle once the technology has been sold. Manufacturer and service provider account managers should work closely with resellers and integrators to ensure that what is promised up front is what is delivered on game day.

Table 3 Vendor/Service Provider Success Factors

Recommendations to Policymakers

Many of our point by point recommendations are meant to foster initiatives, sensible planning, and creative methods of ensuring success on the parts of those who use and those who make/build the technologies that support distance education. At the macro level, however, policies are made with a desire to help practitioners and achieve larger goals (e.g., serve the under-served, or achieve global competitiveness or economic development). As the U.S. Federal Communications Commission, Department of Education, and Department of Agriculture distribute American Rehabilitation and Recovery Act (ARRA), RUS, and e-Rate grants in ways that impact schools, we see some opportunities for implementing policy that can further help practitioners and state planners. A few ideas include:

- Continuing to take into account the ability for grant recipients to create sustainable programs
- Promoting the very concept of distance education. The challenge for many organizations is scaling their programs and having enough teachers and instructional designers to reach critical mass or grow. Promoting the concept of distance education to those states that do not yet appreciate the benefits could go a long way in helping learners and educators.
- Examining ways of fostering increased content. Could this be “approved content?” Or fostering more content from not-for-profits and/or grants programs? We’ve seen that lack of staffing (which can result in lack of content) and poor technological infrastructure are the top two obstacles to successful distance education programs. Though much future content will come from schools and colleges and universities themselves, the very fact that they have trouble scaling their programs suggests that external sources of content will be increasingly important to successful deployments in the future.

Conclusions

Though the research conducted by CILC and Wainhouse Research focused on videoconferencing but explored adjacent technologies, WR believes that most distance education technologies contain very similar requirements inherent in their deployment. They call for bandwidth, training, ease of use, and a purpose. The notion of “purpose” may seem glib, but we have seen initiatives that indeed have lacked purpose and that have failed – again, often due to lack of content or awareness of availability of external content.

New initiatives and ongoing programs share similar needs, and some differing needs. New programs require patience and extra efforts at evangelizing. Yet existing programs too must reinvent themselves periodically.

New initiatives and ongoing programs share similar needs, and some differing needs. New programs require patience and extra efforts at evangelizing. Yet one does not just build a distance education program, put down the keys and “walk away.” Instead, programs work best if they are “baked into the DNA” of organizations, receiving constant evaluation and planning. Thus existing programs too must reinvent themselves periodically, examining what products are being delivered, how programs are structured, and which technologies are in use to support educators and learners.

About the Author

Alan D. Greenberg is Senior Analyst & Partner at Wainhouse Research. As consultant, analyst, and strategist, Alan has worked in the telecommunications, videoconferencing, software and services, and multimedia arenas for more than 25 years, holding positions with Texas Instruments, VTEL, and several Austin, Texas-based startups, and consulting to many organizations. He is distance education and e-Learning practice manager at Wainhouse Research, and co-lead analyst on WR's [WebMetrics](#) web conferencing survey program. He has conducted research into dozens of distance learning networks, was product marketing manager for a set of turnkey classroom packages, and led a number of educational and training initiatives, including serving on the Keystone Conference Steering Committee. Most recently he authored the three-volume segment report [The Distance Education and e-Learning Landscape](#) and authored the white papers [The 2009 Update: Taking the Wraps off Videoconferencing in the U.S. Classroom](#), [Best Practices in Live Content Acquisition for Distance Learning Networks](#), [Mapping the Sea of Research into Video-Based Distance Education](#), and [Super-Size Bandwidth and Two-Way Video in the Classroom](#). He also has consulted to many states, universities, and regional educational consortia on distance education strategies. Alan holds an M.A. from the University of Texas at Austin and a B.A. from Hampshire College. He can be reached at agreenberg@wainhouse.com.

About Wainhouse Research

Wainhouse Research, www.wainhouse.com, is an independent market research firm that focuses on critical issues in the Unified Communications and rich media conferencing fields, including applications like distance education. The company conducts multi-client and custom research studies, consults with end users on key implementation issues, publishes white papers and market statistics, and delivers public and private seminars as well as speaker presentations at industry group meetings. Wainhouse Research publishes a variety of reports that cover all aspects of rich media conferencing, and the free newsletter, *The Wainhouse Research Bulletin*.

About TANDBERG

TANDBERG is the leading global provider of telepresence, high definition video conferencing and mobile video products and services with dual headquarters in New York and Norway. TANDBERG designs, develops and markets systems and software for video, voice and data. The Company provides sales, support and value-added services in more than 90 countries worldwide. TANDBERG trades publicly on the Oslo Stock Exchange under the ticker TAA.OL. For more information, please visit www.tandberg.com.

About CILC

The Center for Interactive Learning and Collaboration (CILC) contributed to this white paper by conducting original research. CILC, established in 1994 as a not-for-profit, specializes in the utilization of videoconferencing for live interactive content and professional development as well as web-based collaborative learning environments for K-20 education. CILC provides consulting expertise in videoconferencing integration, problem-based learning projects, community partnerships in programming with schools, as well as techniques on the effective delivery and development of quality programs. CILC's website, www.cilc.org, provides access to thousands of videoconferencing programs accessible to over 14,000 members representing all U.S. states and over 61 countries/territories.