Best Practices in Live Content Acquisition by Distance Learning Organizations

Enhancing the Primary and Secondary School Classroom by Tapping Content Resources via Two-Way Interactive Video

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Executive Summary

This *Best Practices* guide is based on interviews with numerous content providers, content recipients, and content brokers who utilize two-way, interactive video conferencing as a means of enhancing students' educational experience. It is also based on its authors' respective experience and involvement in distance learning technologies. The guide's focus is on the primary and secondary school levels because a) these are the grade levels in which the greatest amount of new, ground-breaking activity has been taking place recently; and b) instructors, administrators, and technicians in these organizations have been asking for just such a guide. Whereas the 1990s was the decade for vast growth of statewide university- and government-led video conferencing networks, this decade will see the grand arrival of two-way video conferencing in the primary and secondary school environments.

The *Best Practices* guide is intended for those who have installed, or are thinking about installing, interactive, two-way video conferencing. It is intended for everyone who uses this technology and is involved in the "value chain" of content delivery for the enrichment of educational programs. This ranges from the school district just beginning to deploy two-way video conferencing and seek external content, to the school that has long received content and is ready to begin packaging and delivering its own programs to others, to the content provider seeking to improve its own oferings. This guide assumes some knowledge of the technologies involved, but provides some elementary information about these technologies for those new to these topics. More advanced readers may wish to skip the Technology section and review the later sections that focus on best practices in finding and delivery of content.

Educators and classrooms are hungry for good content. Traditionally, three different drivers to video conferencing in the classroom have existed "side-by-side:" statewide networks, urban pressures, and visionaries. In some cases school districts adopted the technology in highly rural locations to become part of statewide networks, and to have access to higher educational or governmental resources. This was often the case in many of the large statewide deployments of the 1990s. In other cases, school districts adopted the technology to respond to the pressures of congestion, overcrowding, busing, or limited curricular resources. Finally, early visionaries saw the possibilities for cultural exchanges and access to far-away experts.

While it is dangerous to say that there is a "typical" model, as every organization is different, the process of deploying interactive video conferencing in the classroom generally follows a series of stages. For districts that are more locally focused, initial deployments tend to remain within the district, enabling the sharing of limited resources across the district, teacher training, and administrative meetings. In a second phase, the technology becomes a tool for seeking content or cultural exchanges outside the district. In the third phase, a district or individual schools become adept at delivering their own programs to others. (See Figure 1.)

Following the deployment of interactive video conferencing by schools, cultural organizations such as museums, science labs, governmental agencies, and zoos have responded by deploying the technology and providing their own offerings to the classroom. They have noted the possibility of enlarging their markets, have watched the technology become more pervasive, and have observed the rapidly growing need for content.

Critical tips for Best Practices in Live Content Acquisition for Distance Learning Programs
(details in later sections of this white paper).

Content providers should:

- Maintain interactivity, be animated
- Avoid a "broadcast" mentality

Content recipients should:

- Seek content providers who strive to deliver programs over distance equal to or better than their local programs; we term this spectacular content
- Seek content providers whose offerings match classroom objectives
- Recognize that excellent content can result from a partnership between provider, recipient, and even content broker

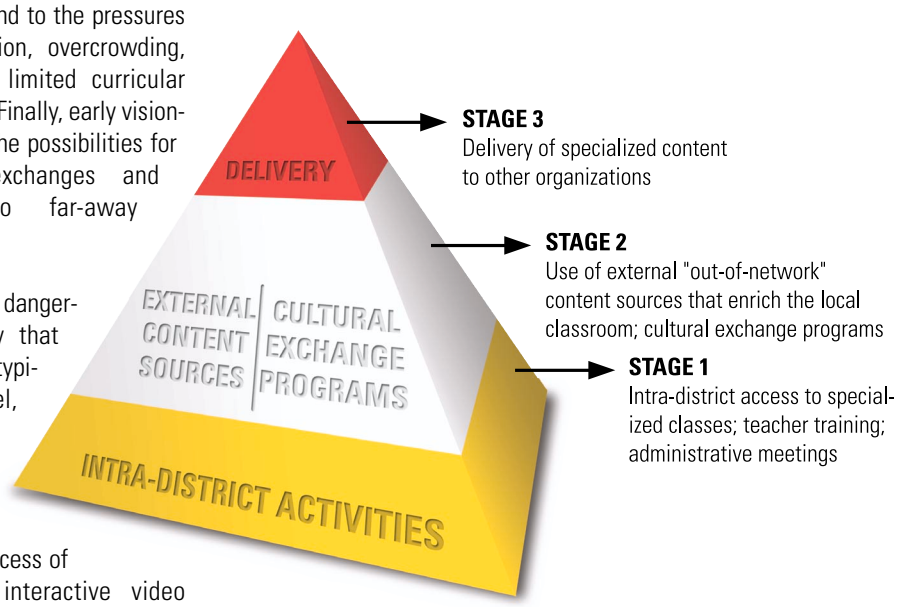

Figure 1: Three Stages of Interactive Video Conferencing Deployment in the Classroom

Executive Summary (cont)
Although delivering "best of class" content is not rocket science, it does require a particular set of skills and methodologies. And, because the technology is so new and in some cases misunderstood as a medium, a shortage remains of excellent content. The best programs sometimes become so oversubscribed that they must turn away inquiring organizations. In general, the total available content has not reached critical mass sufficiently to meet the rapidly increasing demand. As a result, much work remains to be done, particularly on the part of cultural organizations wishing to package their expertise for delivery.

Many of the finest educators know that to do their best, they must have access to a "world of resources." Two-way interactive video conferencing, and the content evolving to support the classroom, can give them access to that world. The goal of this Best Practices guide is to act as an enabling agent for all sides of this equation.

Technology Defined

Interactive video conferencing is one of the primary technologies used to erase the distance between the student and content when distance learning is taking place. Video conferencing in today's classroom environment has hit its stride, providing improved quality, capabilities, and learning experiences. In every case, a content provider or school location has a teacher/student camera, monitor(s), microphone(s), speaker(s), software, hardware, instructional tools and in many cases a personal computer. Often the camera, speaker, microphone, tools and computer are built into a very small system that sits atop a computer or TV monitor. At the center of every video conferencing system is the coder/decoder (codec) used for compression and decompression of audio, video and data signals. The combination of these hardware and software tools creates a simulated classroom environment for remote students.

In recent years, new international communications standards and an innovative understanding of specific applications have allowed manufacturers to construct solutions that provide near-broadcast quality, even at low data rates. These manufacturers have also integrated control systems, automatic camera operation, embedded multipoint units, web servers, content storage units and multimedia instructional tools (e.g. electronic annotation, homework/content transfers, and storage areas) into their offerings. And, these enhanced offerings are now available at lower prices than ever before. These lower price points have increased utilization in the school, office, museum, agency, hospital, military and corporation.

How it Happens

How do you make connections? Today, most schools use ISDN (Integrated Services Digital Network) or Internet Protocol (IP) over their LAN, WAN, the Internet or Internet2. In addition, some schools maintain dedicated data lines for these applications. For example, to launch a scheduled content exchange with the Intrepid Air and Space Museum (or any other IP-enabled content provider--see the Mini-Case Studies section later in this document), you would simply press the call button/icon on the system user interface, enter the IP address for the Intrepid, and (typically) within a few seconds be connected to this World War II aircraft carrier in the harbor of New York City. Because many of today's codecs contain a multipoint control unit, a number of classrooms can be connected together to share this content. (This subject is explored in greater detail later in this document, as some organizations prefer to deliver content site-to-site, while others prefer to deliver content to four or five sites simultaneously.) The point is, networks have improved such that calls can be connected in little to no time at all.

Convergence

Codecs, along with some other technologies such as the World Wide Web and Internet2, are at the heart of the convergence of multiple technologies, media, and methods of instruction. While the focus of this white paper is on best practices, it is worth noting that this convergence of tools and media will have a lasting impact on the classroom, and will lead to a continuing evolution of best practices. At a simple level of

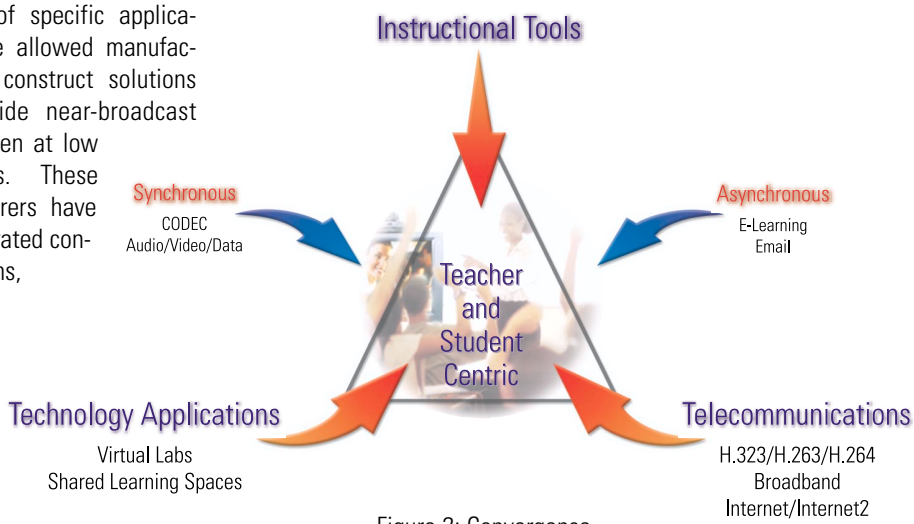

Figure 2: Convergence

Description of Technology (cont)
explanation, synchronous technologies (which take advantage of live interaction using video, voice, and data) and asynchronous technologies (which are available to their users on a non-time-sensitive basis) are already converging through PC-based platforms, scheduling and management software, and the general convergence of the web's initial role as a place to access stored data with newer live capabilities. Other white papers, including those available from Wainhouse Research, describe technologies such as Internet2, IP, and the latest video compression algorithm, H.264. We suggest that interested readers refer to those sources for more detailed information.

All of the converging technologies are teacher- and student-centric in some fashion or another. They all (synchronous and asynchronous) draw on instructional tools, and push instructional tools to evolve to address new capabilities. Figure 2 below illustrates the convergence of the different realms. These tools will allow content from competent content providers to be delivered in entirely new ways, with dramatic impact on the classroom experience.

What is Content?

For our purposes, content in the two-way interactive video conferencing classroom consists of receipt of live expertise from specialized organizations or groups. There are several major classification areas that amplify that definition somewhat:

- **Virtual field trips** – The equivalent of the traditional field trip to an external location. Many early adopters have made field trips to the zoo, scientific and historical organizations such as NASA or Colonial Williamsburg, art museums, musical organizations, hospitals, NASA, Orchestra, using this technology.
- **Visits with specialized experts** – These include visits with college professors, authors, and others with expertise in specific subject areas.
- **Teacher training / in-service training** – Degree and non-degree programs to support teachers
- **Corporate training** – Degree and non-degree programs, Just-in-Time Training.
- **Cultural exchange** – Cross-cultural exchanges between schools or other groups, whereby virtually everything pertinent to the respective groups can play a role in discussion and learning activities. For instance, language, music, weather, food, political ideas, cultural differences, and history all are some aspect of cultural exchange programs.

Clearly not all of these categories are strictly defined as the receipt of content from experts. They may, in fact, include the receipt of content from peers, as in cultural exchange programs. But all share one thing in common: the receipt and/or exchange of rich, live interactive content in the classroom environment, using the technology of video conferencing.

How Does External Content Play a Role in the Classroom?

Good content typically enhances and furthers educational goals. It may fill a gap when particular subject matter experts (teachers or professionals) are not available locally, or it may simply enhance curriculum by providing real-world access to the applications of what students are learning. Generally it works best in classrooms focused on inquiry-based learning, as it fosters interactivity and dialogue. However, good content does not necessarily replace traditional learning activities. Instead, it may supplement them and offer opportunities for new methodologies of teaching.

Benefits

The benefits of content delivery via interactive video conferencing are numerous. Content recipients and content pro-viders experience some similarities and some differences in benefits.

To the Content Recipient

Content recipients can experience the following immediate or long term benefits:

- **Enhanced programs** – Existing or new programs benefit from access to remote experts and groups. Those who adopt interactive video conferencing successfully in the classroom often discover that it leads not just to individual events, but also to *enhanced* programs, or to entirely new programs.
- **Access to experts** – This technology delivers the knowledge and expertise of authors, scientists, college professors, business executives, artists, and many other professionals, providing an access not ordinarily available to students through in-person visits or other technologies. In fact, some highly accomplished, well-known authors and musicians, among others, have been drawn to the medium of video and made themselves available for content exchanges.
- **New dimensions of discourse in the classroom** – Most classrooms grow ac-customed to some degree of insularity and routine. These can be necessary for maintaining focus and discipline. Over time, however, as many educators know intuitively or have learned, this can lead to a "stale" rhythm for learning. By opening up the classroom to the outside world, new opportunities become available for exciting modes of discourse.
- **"Change my life" kinds of experiences** – Anecdotal stories abound of students discovering new directions of study and finding focus and self-discipline through virtual learning. It is not the technology itself that delivers these kinds of experiences, but the exciting and creative application of the technology.
- **The opportunity to evolve into the role of content provider** – Today's content recipient is tomorrow's content provider. As the "three stages" diagram indicated in the *Executive Summary*, an organization can evolve into the role of content provider simply by virtue of accumulated expertise with the medium. Such a role can lead to new educational opportunities for faculty, staff, and students.

To the Content Provider

Content providers can enjoy any of the following immediate or gradual benefits:

- **Further accomplishment of vision and mission** – Content providers can discover that delivering content using this medium fits into their goals as organizations such as providing outreach, providing educational opportunities.
- **New markets** – *No other technology is as suitable for reaching distant markets* (other than pre-recorded or merchandising materials available via mail). A museum can reach only so many regional and traveling constituents; then it looks to prints, videotapes, books, and other media for what are essentially *one-way sales relationships*. Interactive video conferencing in the classroom opens up entirely new markets – worldwide – to such organizations, because learning organizations want more than just materials; they want live expertise to supplement those materials.
- **New ideas and enhanced programs** – Direct interaction with your target market is the best way to understand market demand. By interacting with organizations over distance, content providers can discover new areas for and ways of using their expertise and content.
- **Relationships** – By delivering content over distance, content providers can establish ongoing relationships with content recipients including schools, corporate entities, universities, and other content providers.
- **Revenues** – While return-on-investment models will vary from organization to organization, a savvy organization will determine that money can be made delivering content.

Things to Look For

Spectacular Content

The first thing to look for, especially if you are just beginning to receive educational programs in the classroom, is one thing only: the spectacular program. If your first programs are spectacular, you'll win over many converts and will never fail to find support for your initiatives. If they are lacking in quality and people are disappointed, however, roadblocks will surface down the road. Finding a *spectacular program* will sometimes be challenging, as program quality can be somewhat subjective.

In addition, not all content must fall into the category of *spectacular*. We believe, however, that success often depends upon hitting a home run in the first inning. Therefore, we recommend that organizations seek spectacular content for their debut offering. More mature content users and providers will understand that not every content element must be spectacular in the traditional sense of the word—but they also will understand that the technology is limited only by the imagination of its users, so the sense of spectacular is a useful goal for which to strive.

A reasonable question to ask is what defines a spectacular program. We define a virtual program as spectacular if it provides a learning experience that is equivalent or superior to the experience enjoyed by local students. As we said earlier, this is not a broadcast medium; it is an interactive medium. Thus, the organization delivering spectacular content understands that its goal is to deliver content with significant interactivity (that may emulate, or be very different, from how it delivers content locally). This can only be accomplished if the content is high quality and blends into place into the school curriculum. And, the content can only blend into the school curriculum if it has been developed with the 'hooks" that enable blending into curriculum.

People talk about spectacular programs. As of this writing, educators were "abuzz" with discussion of the Global Nomads Group *Project Voice: Baghdad* program[1] that linked American students with Iraqi students both pre-war and post-war. The impact on the students was nothing less than profound and included rich lessons about democracy, history, politics, and culture.

Signs of Spectacular Content and Content Providers

Though you may not always know if a content provider is going to be spectacular, a few signs exist that can help an organization find best of breed providers. A short list of what to seek includes the following:

- Those who "lay it out" for educators, making it easy to access their instructional aids. (Do they offer a website that includes not only curriculum offerings, but also pre- and post-event tools and media?) Alternatively, do not confuse ease of access with "easy on your students." Seek programs that make your students work and not be passive recipients of the content delivery, because the better the pre-activities, the more focused the event can become[2].
- Those who are clear about the degree of interactivity they deliver during an interactive video session. This is not just about if and how they ask questions; it is about how they integrate specific activities suited to the topic and designed for students to complete during an interactive video session.
- Those who have subject matter experts on-hand or the specific content programs you need, and the ability to deliver (having an expert doesn't mean anything if that expert and the program are not catering to the needs of distance learners).
- Those who have a feedback mechanism—and utilize that feedback to maximize quality. Ideally, the feedback and teacher / trainer evaluation reports would be available to you for review.
- Those whose services include both automation (registration, web info) and a human touch. Certain tasks are best performed online, while others require personal attention. Good firms understand the difference and incorporate both into their offering.
- Organizations with a blend of technical staff and educators; one without the other could spell doom. Whether or not an instructor should also operate the equipment depends upon the atmosphere, culture, and environment, but clearly technical support staff must be available to assist educators before, during, and after learning sessions.
- Those passionate about what they do. Those with a passion for content creation and delivery are more likely to create high-power, high-impact, interactive sessions.

Funding

The adage "you get what you pay for" applies directly to distance learning content. Therefore, you should expect to pay for valuable and professional content. Some content may be free because the organizations delivering the content "subsidize" the distance learning programs, but even these if ISDN-based, often will require the content recipient to dial in and pay for connect charges. Some content providers also offer free introductory sessions to educators, giving a sense of their programs and how the technology works.

Budget-constrained content recipients may need to be willing to negotiate, barter, or otherwise determine some method of offering value in exchange for value. Rarely should a content recipient expect to receive help from a content provider in finding third-party support dollars, but it is worth asking the right third-party organization (such as a broker or other organization whose mission is to enable excellence in learning content) for help in finding support funds.

[1] http://www.gng.org

[2] Note that not all virtual field trips or distance learning sessions via video require pre-activity. The need for pre-work and post-work is determined by the subject matter and curricular content.

Content recipients should also think "out-of-the-box" in terms of funding their initiatives. For example, if a science class is seeking delivery of a surgical procedure such as open-heart surgery, it might make sense to approach student parents in the medical field and ask if they'd be willing to contribute to the program. In addition, some equipment vendors and network providers make funds available for special events or worthwhile causes.

Understanding State Requirements

In not all instances will educators be able to ensure that curriculum being accessed matches state requirements. But with the amount of testing as the result of *No Child Left Behind* and other state-specific educational initiatives, it is all the better when a content provider is aware of a state's requirements, or can respond to them.

At a minimum, content providers should attempt to understand a content recipient's specific classroom requirements as they relate to that class's learning objectives. No museum educator, as an example, can spend hours pre-event learning about your particular state requirements. But the educator with a short list on hand of questions to ask about your requirements is doing you a favor. These can be along the lines of who will be in the room? What are your educational objectives? How well are the students doing in a particular area related to the topic being covered?

Sources

While there is no single "clearinghouse" for content providers, various online guides are available that list specific organizations, programs, grade levels, urls, descriptions, and contact information for content providers. Some of these guides, such as the Nassau BOCES guide listed below, are being converted into searchable databases. The following list is just a partial listing of online resources.

Sources

Organization	Web Address
Devon Curriculum Services "Video Conferencing in the Classroom"	http://www.devon.gov.uk/dcs/a/video/book/sectf.pdf
Digital Bridges	http://www.netc.org/digitalbridges/resources/index.html
Nassau Board of Cooperative Educational Services (BOCES)	http://www.nassauboces.org/cit/vls/wholeGuide.pdf
New York Institute of Technology Education Enterprise Zone	http://www.nyiteez.org/
Polycom Content Provider Directory	www.polycom.com/education
SBC Knowledge Network Explorer	http://www.kn.sbc.com/wired/vidconf/directory.html
Vision Athena	http://www.visionathena.org/pub/index.asp?cp=content,cplist
Two Way Interactive Connections in Education	http://www.twice.cc/shared.html

Directories alone are not always the answer. Network with others and you will find them to be the single best source of information about reliable content.

Program Building

The goal of using content is not to simply receive programs sporadically from cultural organizations (as an example). For a content recipient to truly embrace this technology, it must focus on *program building* just as much as the content providers focus on program building. In this sense, content recipients cannot be a *passive* receiver of content; it is vital that recipients work together with remote content providers. The recipient organization must take responsibility for understanding the intent of a program, and to ensure that appropriate conditions are in place to make the experience for local students interactive and not passive.

Some organizations expect a minimum of three conferences built around a topic. The first is with a content provider to discuss learning objectives. The second is the session itself with the content provider. The third is one in which the students come together with the content provider or, if it was a multisite event, come together as students to discuss over video the outcomes and results. Students can still obtain feedback from the content provider or at least amongst themselves. In fact, a healthy competition can develop between multiple sites that can lead to furthering the educational goals of the effort.

Program building means starting with teachers who are risk takers, who are looking to do something new in the classroom, and who are focused on inquiry-based pedagogy. It also calls for staying focused on outcomes; the purpose of receiving content from elsewhere is not to just hold a specific event, but to have a learning experience.

Program building also requires people who are capable of building programs, as well as technical staff. Both are necessary to function as partners to create an effective environment for using content from content providers.

Working with Students and Providers

Prior to receiving content from a content provider, certain of the following tasks should be completed or tips should be considered:

- **Stay focused on outcomes** – The goal is to know where you want to take the class as learners.
- **Prepare the students** – It is very important to work with students prior to their first experience with this technology. At the very least, students should understand the ways in which they should participate and interact during the session.
- **Be careful in mixing student levels** – Some mixing is possible, but in the same way a school is not likely to mix 12th graders with 8th graders in a class, rarely does mixing work in a truly interactive classroom environment. There may be some exceptions, but as a rule differing groups require differing approaches.
- **Prepare the content provider** – A content provider may have brilliant content, but if not informed of conditions in the local classroom, can easily be blindsided. For instance, it is very important that a content provider be informed if a class includes special-ed or learning disabled students. The provider can use such information to cater the content to the circumstances of the students.

Multi-Site or Single-Site Events?

One controversial aspect of content delivery has to do with multi-site events. Some practitioners adore them and believe they are a fabulous way to reach large numbers of students at one time. Others abhor them and believe they dilute interactivity and result in clumsy, strained events and a poor learning environment. The truth is actually somewhere in the middle of these two opinions. In some instances, multi-site content exchanges can be rendered flawlessly, while in others they do indeed interfere with interactivity and learning. This is partly because multi-site sessions require greater management of the technology. If the technology is not effectively managed, the multi-site session can become an oppressive barrier to learning

Rather than insist on one way or the other, we advise prudence and common sense. One should consider whether the topic lends itself to a multi-classroom session and if the number of students in each classroom is small enough to foster interactivity.

Some organizations will set limits and permit a handful of receiving sites to participate in an event. In general, large multi-site content delivery sessions are a bad practice if not handled carefully because they dilute the interactivity. The worst thing a learning organization can do is not inform a content provider that it intends to have multiple locations attending the program; doing so can negatively impact the provider's ability to meet its goals and your goals.

Facilitation of Events

Event facilitation starts prior to each event, and concludes after the event is completed. In other words, it is important to place emphasis, when it is educationally appropriate, on classroom pre-work and post-work. These two areas can enhance the learning, and again, make it about more than a single event.

Some general rules of thumb are:

- Maintain someone in the room during every video conference class event. Both a local facilitator able to call on students and support the remote content provider, and a technical support person (whether in-room or close by) are mandatory. Holding a class with an expert in a remote location is not an excuse for slipping out of the classroom to take a break.

Facilitation of Events (cont.)

- Follow-up is an important part of a virtual learning program as it helps content providers improve their programs and helps recipients understand what they are getting with particular providers. For the sake of future students and participants, be honest and fair throughout the feedback process. Give an organization the benefit of the doubt if you believe technical or other issues prevented them from meeting your objectives.

How To Partner for Good Content

You Can Pay

Not only can you pay, you *should* pay. Why is this? Well, as discussed earlier in the How To Find Good Content section, using this technology draws on the content provider's extensive infrastructure and investment in resources. Therefore, the content provider deserves appropriate reimbursement for its investment. Another more compelling reason is that requiring that it be *paid for content is a gauge of sustainability—and ultimately of an organization's commitment to quality.* The museum or zoo that charges for its programs has more reason to make certain its programs are effective, because a) poor evaluations and word of mouth from *paying* content recipients will send them scurrying away, and b) the organization that charges for its content likely has a business model that is sustainable and likely to keep it afloat.

This is not to say that you should not be willing to acquire content from an organization that offers it for free; but it is to say that you should pay close attention to why that organization is able to offer it for free. Is it because there's so little demand (based on a poor track record) that its fees have shrunk so it could still indicate it has a program? Or is it because it has grants and budgeted properly to be able to deliver content for free? One never knows unless one asks.

You Can Partner

Can't afford equipment? Did you think about grants and (in the U.S.) e-rate dollars? Organizations like the Education Enterprise Zone are adept at helping schools write grant proposals. But, suppose no direct grant monies are available. Another approach is to offer content and in essence prepare for leaping directly to Stage 3 of the implementation of video conferencing. Some organizations make equipment available to other organizations based on the "banking" of credits toward that organization delivering content. In essence a school or district trades its own expertise in exchange for the infrastructure necessary to deliver that expertise. Naturally it may require some time to prepare to become a content deliverer, but the framework is set into place.

Similarly, cultural institutions, by virtue of their non-profit status, are often least able to find funds for new equipment and programs. A typical method is to find an organization with a vested interest and attempt to barter for a "starter system" that helps you show proof of concept. While we do not recommend "low-balling" an effort, if a museum or library can start with a single set-top system and create programs that generate revenue and outreach activities for the organization, it gets a start. Decision makers can then see the value and more easily decide to invest in more ambitious classroom, auditorium, or other environments suitable to the content being delivered. In other words, there is no shame in starting small and building a program in stages.

Things to Do

There is no single place to go to find standards for excellence in training across video, just as there is no existing (yet) standards body. Some training programs are available worldwide, not only from a large number of educational organizations such as higher education and community colleges, but also from organizations such as the U.S. Distance Learning Association (USDLA). The educational world is, however, making progress in this area. Among other programs, The New York Institute of Technology (NYIT) EEZ and Vision Athena are working with others to create an accreditation process for content providers. This will go a long way toward supporting a consistent rating system and "raise the bar" for good content delivery. Such an accreditation process will be about not only accrediting organizations or instructors, but also defining the infrastructure necessary to deliver and receive content. These efforts were underway as of the publication of this report, but it may take some time before they begin to have an impact.

In the meantime, there are activities a content provider can focus on, and activities a content receiver can do to facilitate the process and ensure that good content and good delivery take place.

For the Content Provider

The content provider's primary task is to foster excitement and interest in the topic, spark critical thinking skills, and engage with remote (and any local) students. This technology, when used properly, can create a true sense of excitement and "Ah Hah!" attitude among its users. The number one trick to delivering excellent content is to keep any actual event as interactive as possible. By maintaining interactivity, those at the remote location become engaged and likely to remain with a program–*regardless of their initial interest in the topic*. We've seen and heard stories of interactive video sessions in which the students least expected to get involved actually surprise their instructors and become more engaged and driven to learn than ever before.

Without encouraging practitioners to the point of excess, we believe that animated delivery is an extremely important tool in the interactive video environment. This does not mean that instructors should dart around a room to hold their audience (an inappropriate behavior using this technology, in fact). It does mean, however, that instructors should maintain a pace, movement, tone, and emotional affect that will hold the attention of those in the remote sites. Failing to do so can lead to disorder and lack of interest and focus.

It is equally important that the content provider know the technology and how to use it. Using interactive video conferencing is not about just sitting in front of a camera and talking for an hour. It involves making intelligent, *immediate* decisions about which cameras to use, when to switch between video and data, and how to integrate other presentation tools into the learning environment.

Using this technology also is about understanding the things that can and sometimes will go wrong. For example, the sound of a jackhammer or leaf blower outside the classroom window can render a session nonproductive and frustrate everyone—remember this small detail and have such activities scheduled to work around distance learning sessions. In addition, facilitators and technical support staff should verify that all peripherals are connected and available, particularly in shared-used spaces. Test calls must be placed before the session to confirm full functionality.

The content provider should avoid making extremely large multi-site events an integral component of its distance learning programs (at least when using interactive video conferencing). Multi-site events can turn perfectly good content into the learning equivalent of delivering Teletubbies or Mr. Rogers to university physics students; you'll lose your audience. As stated earlier, this is an interactive medium, and nothing serves to dilute the possibilities faster than treating it as a broadcast medium.

This takes us back to the need to know your audience—and the organizations to which you are delivering content. These organizations often have technical staff, administrative staff, and instructors involved in various ways as content recipient. You don't have to handhold them every step of the way, but if they are new to the world of interactive video conferencing in the classroom, you can take a lead in setting expectations.

Similarly, if you are new to delivering content, don't be embarrassed to seek help. Some content brokers can be an excellent resource because they have the incentive to help you deliver your content effectively. They also can help develop marketing strategies and marketing materials support new or existing programs. Similarly, organizations like the New York Institute of Technology Educational Enterprise Zone and the Tennessee-based Project DIANE are available as consultants to help content providers a) define content; b) assess or improve existing or new content. Such organizations can even help content providers find grants to fund the development of new content, help assess the quality of their content, and assist in "alpha testing" that content to enable modifications and improvement.

For the Content Recipient

As stated earlier, the connection between content provider and content recipient is based on a facilitation that takes place at both ends of the equation. Thus it's important for the content recipient to take responsibility for the technology components of the program at their end, as well as the instructional facilitation necessary. In terms of technology, this means that the receiving organization does a test call, has all equipment

For the Content Recipient (cont.)
and network available, and has staff available to respond to technical issues should they arise.

In terms of instructional facilitation, it means that for the content provider to effectively deliver content, some local control must remain in the room. Put differently, the content recipient (read: instructor) must maintain an active role in the learning taking place, rather than allowing the class to become a passive recipient. This equally goes for the students, who usually willingly accept this role.. Maintaining that "audience intelligence quotient" is *mandatory* if effective learning is to take place.

Three Case Studies

Intrepid Sea-Air-Space Museum

New York, NY, USA

Phone: 212.957.3701

Email: Gene Carlucci, Museum Educator, gcarlucci@intrepidmuseum.org

Website: http://www.intrepidmuseum.org/education_vc.html

Cost: $150 per program

The Intrepid Sea-Air-Space Museum offers four primary programs for distance learning delivery, which it calls *Techno Trips*, and is adding a fifth in fall 2003. This converted World War II aircraft carrier focuses on honoring heroes, educating the public, and instilling a spirit of service. This program is worth highlighting for the following reasons:

- Focus—it doesn't try to do everything, but what it does it does well. It offers a limited set of programs with well-honed delivery methods.
- It discusses its programs with content recipients and attempts to cater content as necessary.
- Each program includes the release of pre-visit material with suggested activities, lesson plans, suggested vocabulary materials, and even video etiquette tips. These work to enable educators to prepare their classes for the virtual field trip.
- It utilizes the local instructor in the classroom as a facilitator, instead of trying to "run" a field trip alone from the museum.
- It also works hard for post-visit follow-up activities and evaluations.

The Intrepid uses exhibits, artifacts on camera, and even takes advantage of animated graphics to "beef up" its content. And, it works hard to maintain interactivity in the midst of virtual field trips.

Los Angeles County Museum of Art

Los Angeles, CA, USA

Phone: 323-857-6215

Contact: Mary Lenihan, Associate Museum Educator, Mlenihan@lacma.org

Website: http://www.lacma.org

Cost: $100 per program

The LA County Museum of Art (LACMA) delivers a variety of programs that showcase the museum's permanent collection of more than 100,000 works of art. It focuses more on paintings (European and American) than sculpture or other forms, offering seven topical programs. An eighth program, aimed at children, is designed to teach them how to look at and appreciate paintings.

The Museum has implemented an innovative, inquiry-based approach that weaves art with history. Some of its programs focus on the rich his

Intrepid Sea-Air-Space Museum

Content Program	Grade Levels	Focus
WWII: The Pacific Campaign	9-12	Students explore WWII in the Pacific, and American's involvement through the use of sea and air power
Take-Off (How do airplanes fly?)	4-8	Aircraft components, principles of how planes fly, and students design own paper airplanes
Heroes Remembered	4-8	Using photos and artifacts, an educator shows how war heroes have sacrificed and space program heroes have taken us to new frontiers
Geography	3-4	A new program to introduce students to geographical terms and its importance
How Do Boats Float?	1-3	Students learn how boats float by looking at famous ships and learn how to make their own boats

Los Angeles County Museum of Art (cont.)

tory of California artists, and it is a participant in *Windows on the World*, a project that ties together California public and school libraries with content providers such as LACMA. Other programs focus on teaching American history through art, impressionism, and European painting from the Renaissance through the 19th century.

LACMA is worth highlighting for the following reasons:

- The organization is willing to tailor programs for general or school audiences, starting at grade 4 through grade 12, and even delivering content to the junior college level. (Its introduction to how to look at art, called *The Building Blocks of Art: How to Look at Paintings*, can be delivered to children as young as kindergarten and grade 1.)
- The Museum offers programs from one hour to 90 minutes in length, but shows great flexibility in breaking up those programs based on a classroom's needs. If an educator wishes them to go into greater depth on individual works of art, for example, the Museum is willing to segment a program into as many as four individualized, in-depth sessions.
- The Museum offers top-notch objects and examples by some of the best American and European artists, from John Singleton Copley (French and Indian War) to the Hudson River school, and from John Singer Sargent and Winslow Homer to Rembrandt's *The Raising of Lazarus.*
- Evaluations indicate that the Museum is appreciated when it allows students to ask questions on the spot. Thus it tries to make school programs interactive throughout, using educational techniques for facilitating discussions. It offers a pre-visit package with tips on classroom management, lessons, vocabulary, question and answer materials, tips for facilitating a program, suggested pre-program activities, and suggested follow-up activities to reinforce the learning.

The Museum is not delivering general art history classes, so educators seeking this type of content should look elsewhere. Instead, it showcases its own collection through some very creative course content. The Museum also will conduct free demonstrations for groups of teachers, administrators, and school superintendents, typically 15 to 20 minutes sessions. It was undergoing a transition based on reorganization and some equipment replacement, and as of publication of this white paper was expecting to resume delivery of its programs by the end of 2003.

Los Angeles County Museum of Art

Content Program	Grade Levels	Focus
The Building Blocks of Art: Learning to Look at Paintings	5-12 and adults	Provides participants with a looking strategy that can be used when viewing any type of art and when visiting any museum collection.
American History through Art at the Los Angeles County Museum of Art	5-12 and adults	American artists often drew inspiration from social trends and historic events; by viewing and discussing key artists' works, audience members participate in a visual tour of American history.
A Survey of European Art Painting from the Renaissance through the 19th Century	5-12 and adults	Focuses on a selection of paintings by artists such as Titian, Jean-François Millet, and Claude Monet. The program creates an historic context for the art, and discussion emphasizes its evolution from the Renaissance into the 20th century. (Two-part program.)
Color, Light, and Modern Life: Impressionist Works at the Los Angeles County Museum of Art	5-12 and adults	Focuses on works by artists including Claude Monet, Auguste Renoir, and Edgar Degas to illustrate how each artist made the Impressionist style his own. Discussion also considers what effect social and political events of the day had on their artistic production.
Images of California	5-12 and adults	Experience California as artists see it.
Introduction to Contemporary Art	5-12 and adults	Shows how artists from the last fifty years have explored new ways of making art.
Introduction to Modern Art	5-12 and adults	After the year 1900, art changed dramatically; this program explores works that show cubism, abstraction, and other modern approaches to painting
Italian Renaissance Painting	5-12 and adults	Investigates how painting changed in the Italian Renaissance, ranging from works done specifically for the Catholic Church to non-religious paintings such as portraits and landscapes.

Museum of Television and Radio

Beverly Hills, CA, USA

Phone: 310-786-1035

Contact: Susan Swarthout, Education Manager, Sswarthout@mtr.org

Website: http://www.lacma.org

Cost: Program Overview and/or Technical Demonstration: free. 60-minute field trip: $125. Custom classes: $200

The Los Angeles-based Museum of Television and Radio provides interactive, inquiry-based, content-rich video conferencing. Like LACMA, it uses its archives, in its case over 120,000 radio and television programs. This museum, however, teaches on a variety of general subjects, using the content as a departure point. It can provide custom classes for organizations, but there must be some type of connection to television or radio content.

We give it high marks for several reasons. One consists of the "buzz," albeit subjective, about its programs (a media-focused organization based in Los Angeles is likely to be media-savvy and creative in its content). Other reasons it is worth highlighting are the following:

- It teaches media literacy in conjunction with its curriculum. It seems to focus on not just teaching the content, but teaching how to view the content and develop critical thinking skills and vocabulary to support the content discussions. In this sense, it strongly supplements inquiry-based classrooms.
- It also works to encourage students to be active TV viewers, not passive viewers.
- It places great emphasis on strong degrees of interactivity.
- It is extremely creative in its content offerings, as a review of the table below will demonstrate. That creativity extends into the actual lessons; as an example, one exercise is for students to create their own endings to episodes of Alfred Hitchcock Presents.

The Museum delivers each program with about 4-6 video or audio clips that total up to 10 minutes, after starting with a vocabulary lesson. Each clip has a focus question and a series of questions asked after the clip is seen or heard. While the lessons are structured, the Museum nonetheless also takes some lead from student questions and interests, allowing for analysis and comparison activities.

The Museum also delivers a significant amount of in-services training and focuses on matching up the right content for particular types of students. In this way it achieves the double reward of ensuring that groups receiving content later are properly prepared and comfortable with the technology, while also helping educators understand how to work with and leverage the Museum's offerings.

Museum of Television and Radio

Content Program	Grade Levels	Focus
Muppets and Puppets	K-3	This class opens a window to the delightful world of Jim Henson's Muppets, and other puppets on television, exploring many aspects of puppetry and char acter development.
Fractured Fairy Tales	K-4	In this class a humorous selection of Rocky and Bullwinkle clips from the Museum's collection provide a way to examine story structure and the ele ments common to all fairy tales.
Around the World	K-4	Students learn about the many different ways people live, work, and compare their own experiences to those of children in communities all over the world.
Tooned into Animation	1-5	Students learn about different techniques and styles of animation, and consider which stories are best told with this dynamic and creatively liberat ing process.
Think Green	2-5	Students explore the complex relationship between the earth and its inhabitants. They learn about the media's advocacy role in protecting the environment and how they themselves can work to preserve the planet.
The Fine Art of Persuasion: Television & Advertising	4-12	What is advertising and what are its methods? Through careful analysis, students discover how advertising has developed certain tools and techniques that capture viewer attention to promote a product, a person, or an idea.

Museum of Television and Radio Cont.

Content Program	Grade Levels	Focus
The Civil Rights Movement on Television	5-12	Television played a vital role in the Civil Rights Movement, both as observer and participant. By watching a selection of significant television work from that era, students explore the role that television played in recording and shaping the struggle for equal rights in America.
The Master of Suspense: Hitchcock on the Box	5-12	Alfred Hitchcock enlivened the suspense genre with tongue-in-cheek introductions, macabre humor, and twist endings. Students analyze Hitchcock's use of the ordinary to create exciting, even frightening, television drama.
The Television Documentary: America through the Lens	6-12	By examining, comparing and contrasting a variety of documentaries from the Museum's collection, students learn how different techniques serve different visions and think about what types of stories are best suited to the documentary form.
Animation: Not Just for Saturday Morning	6-12	By viewing rare and unusual examples of televised animation, this class encourages students to expand their definitions of this popular technique and to develop a critical vocabulary necessary to evaluate and discuss it.
Presidential Campaign Ads	7-12	Students examine campaign advertisements from the past fifty years to learn how candidates attempt to win the hearts, minds, and votes of the American people. Participants deconstruct ads to identify effective advertising styles and techniques.
Raising the Curtain on the Cold War	9-12	1950s America was consumed with fears of war and the atomic bomb. Through close examination of television programs from this pivotal period in modern history, students learn how television reflected and perpetuated the pervasive paranoia and hysteria.

The limited number of s*pectacular* content providers today leaves much opportunity for those interested in leveraging interactive video conferencing in the classroom. The seeds have been planted, however, and we expect to see significant new content offerings become available in coming years, which will be the equivalent of bringing the world into the classroom in ways never before imagined.

This guide cannot summarize all best practices, and its authors welcome feedback for future versions. The technology, and more important, the users of the technology will inevitably push the envelope and find new topics and new methods of delivering content using interactive video conferencing. But the essentials are provided herein for creation of robust programs that utilize the technology to the fullest.

About the Authors

Alan D. Greenberg is a Senior Analyst & Consultant at Wainhouse Research. As consultant, analyst, communicator, and strategist, Alan has worked in the telecommunications, video conferencing, software and services, and multimedia arenas for 20 years, holding positions with VTEL, Texas Instruments, and several Austin, Texas-based startups, and consulting to many organizations. At VTEL he 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. Most recently he was primary author on the segment report, *Video Communications Management Systems*. He also has authored reports on conferencing endpoints & bridges, streaming video, distance learning, and voice/fax services. He specializes in primary end user research and is a trained focus group moderator and interviewer. Alan holds an M.A. from the University of Texas at Austin and a B.A. from Hampshire College, Amherst MA. He can be reached at agreenberg@wainhouse.com.

Russ Colbert is Global Education Market Manager for Polycom, Inc. He is also very active in State, Local, Federal, Healthcare and Corporate Training applications. At Polycom his responsibilities are to ensure complete customer and partner success, support product development related to his segments and to facilitate industry utilization of educational technology. Prior to joining Polycom, Russ was the Director of Global Markets with VTEL Corporation. During his five years in this capacity, he was directly responsible and active in large-scale education implementations in all 50 United States and 43 countries around the World. As an education specialist he has trained teachers, helped transition courses of instruction, designed classrooms, and developed several turnkey classroom packages with software, instructional tools, hardware and processes. He has held positions with Peirce-Phelps, Inc. and the United States Navy's Videotele-training Network. He holds a B.S. degree from Auburn University and an M.S. degree from Old Dominion University. He can be reached at rcolbert@polycom.com

About Wainhouse Research

Wainhouse Research (http://www.wainhouse.com) is an independent market research firm that focuses on critical issues in rich media communications, video conferencing, teleconferencing, and streaming media. 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 *Conferencing Markets & Strategies*, a three-volume study that details the current market trends and major vendor strategies in the multimedia networking infrastructure, endpoints, and services markets, as well as the segment report *Video Communications Management Systems*, the free newsletter, *The Wainhouse Research Bulletin*, and the free e-zine, *ConferencingBuyer*.

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Polycom develops, manufactures and markets a full range of classroom, corporate training, and medical education solutions through its high-quality, affordable voice and video communication endpoints, video management software, Web conferencing software, multi-network gateways, and multipoint conferencing and network access solutions. For additional information visit http://www.polycom.com/.

Appendix A - Ackowledgements

The Guide to Best Practices in Content Acquisition by Distance Learning Organiza-tions is based on its respective authors' experience working with distance learning organizations, along with in-depth interviews held with a number of content providers, content recipients, and content brokers. We wish to thank the following individuals and organizations, without whose support this document could not have been written. The interesting fact to note is that we found consistency in their feedback and comments, suggesting that we're on the right track in this white paper.

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