WHITE PAPER: PREPARING YOUR SCHOOL FOR THE VIDEO REVOLUTION

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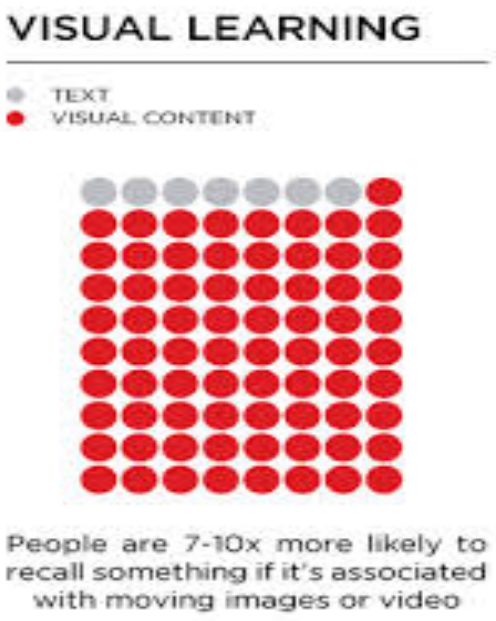
OVERVIEW

Building a 21st century school starts with understanding how a 21st century student learns, and it can be summarized in one word: **Visual!** Your average middle school student spends 3.5 hours a day outside the classroom consuming visual content. They associate that content to every aspect of their lives, including what they are learning inside the classroom. Video is the most stimulating visual content, and it appeals to 95 percent of learning modalities. More importantly, video and moving images improve retention by seven to ten times.

Embracing video in your classrooms might be the most important curriculum enhancement you can provide in the next three years and will undoubtedly increase test scores if done in a comprehensive and well-designed manner.

This paper will provide insight into some of the successful practices K-12 districts have implemented in the past few years. It will also highlight the challenges of delivering video to a school or district. Rest assured, you will gain valuable knowledge that will set you and your district on a course to successfully adopt video for instructional and administrative benefit and appeal to your students' craving for a more visual representation of their course of study.



"The Onslow County (NC) School System recognized the benefits of a comprehensive and innovative video platform to enhance educational opportunities and experiences. Connectview, through a unique blend of consulting and implementation services, allowed the district to expand our vision "Excellence in Education."

– Ross Friebel, Director Instructional Technology & Media

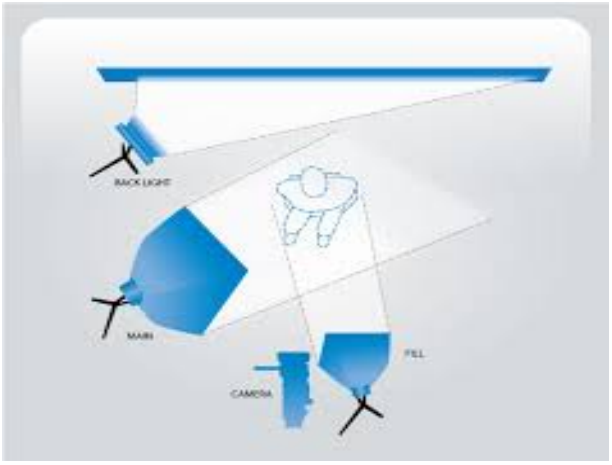
CONTENT CREATION & VIDEO CAPTURE

Implementing a successful video strategy incorporates four core elements: Capture, Distribution, Management and Consumption. The first and likely the most important element is to capture as much quality video as possible. While seemingly easy, it can be an emotionally stimulating experience and present minor anxiety, especially for those intimidated by new technologies.

A school should consider three methods for capturing video. The first incorporates a fixed studio style method. The fixed studio adds value by enabling novices to easily capture footage in a controlled environment that mitigates the normal anxiety of operating a camera. The cost of a well-designed studio for a school application can range from a few thousand dollars to tens of thousands, but the most critical components rank in specific order: audio, lighting and the video codec of your choice. Inexpensive consumer grade cameras will adequately capture full HD video quite well and will allow a school to budget more for a good encoder that has multiple inputs and a mix of post-production components.

Audio, being the most important component to good video, is also very affordable. When possible, invest in a good wireless microphone platform that provides a superior omnidirectional transmitter on a lapel or lavaliere clip. This places the microphone close to the speaker and away from the hands, an important consideration with student produced content. There are a number of quality manufacturers on the market, which makes the decision-making process a bit foggy. To clear up the clouds a bit, find a scalable solution that will enable you to add microphones individually and then pair with a microphone mixer that supports four or more microphones and auxiliary inputs.

The lighting system, while very important, is also an area that is surprisingly affordable. A school should focus on portable or semi-portable kits that incorporate LED technology and at least 500 watts per panel/light. Three lights are ideal and are configured as the key light, fill light and backlight as seen in the diagram. Lighting can make a tremendous difference in the quality of the video and can reduce post-production and color correction time significantly. This is very important for live streaming video applications.



The video codec is tremendously important and can make or break the successful adoption of a fixed studio in a school. When considering a fixed video codec, start with the format first, then the production/editing software, and lastly the switching capacity of audio and video inputs. A fixed codec doesn't have to be a bulky beast of technology. In fact, software advancements have enabled very sophisticated production tools to be built into a small form factor or reside on a desktop/laptop computer. To support HD and make it available live across a network, a school should only adopt an H.264 codec. While H.265, 4k and WebRTC are all developing formats, none have been ratified, and the H.264 codec can support 1080p HD at both 30 and 60 frames per second. There are dozens of manufacturers on the market today, but a district should try to stay with a leading edge manufacturer like Vbrick or Newtek.

Now that the three primary components have been addressed in the fixed studio platform, consider adding more source options to the school as demand requires. Mobile enabled capture is growing in popularity and scale, largely due to the tools that come native to many 1:1 devices currently being adopted by schools. Software encoding lacks some of the robust features of a studio codec but comes with a price point that is more than 10 times lower, allowing schools to scale for more Flipped Classroom and ad hoc video desires. The same audio and lighting parameters apply when logistically practical. A tablet can create very powerful video and is widely available to many students.

Lastly, consider tools that aid in streamlining—the adoption of video like Pan, Tilt, Zoom tracking devices, IPad Teleprompters, and Bluetooth microphones. These tools help faculty and staff more widely accept using video; thereby increasing content creation.

"Connectview has been a nice sanity check for us. They are a true partner and help us navigate around the opportunities out there"
– Cris Harshman, Director of Technology Support, Asheville-Buncombe Technical Community College

RICH MEDIA & WEBCASTING

The last decade has brought tremendous change to the definition of webcasting, especially during the past three years. Corporations have utilized the tools from early adoption to mass production, and in some cases, host more than half a dozen per day. The tools have historically been very expensive to procure and difficult to manage. In contrast, institutions such as K-12 districts have largely shied away because of the complexity and cost, despite their administrative benefit to rapidly transmitting valuable information like professional development content.

In recent years, bright lights at the end of the tunnel have emerged for webcasting; namely, the requirement to insert non-video content side-by-side with live video. The culture shift away from PowerPoint has been slow to grab hold, so webcasting had to incorporate technology that allowed sharing the video screen with the computer screen. The result is a highly effective way to disseminate information in an asynchronous method for mass consumption without the need for travel.

Schools can now leverage this tool to reduce costs in professional development, weekly leadership meetings and integrate non-video content into board meeting sessions. Institutions will soon begin to leverage webcasting to engage students, community and staff in a more meaningful and repetitive way. Rich Media has also advanced to include interactive polling, embedded animation and annotation enriching the communications process. Districts can now reduce costly travel by utilizing webcasting tools.

Leveraging webcasting across a district does require specialized tools to deliver the video efficiently on the LAN/WAN so as to not impact Internet bandwidth and transcode the formats to be consumed on tablets without requiring a specialized application. Luckily, the same platforms required for managing curriculum-based content, IPTV and on-demand content also license sophisticated webcasting software.

STUDENT PROJECTS

Students are so adept at using video that they rarely make audio phone calls any longer. Applications such as FaceTime have popularized video adoption by students. Therefore, schools must evolve to normalize and encourage the use of video tools into the curriculum. Video enables students to take project-based learning into the 21st century.

The most popular use of student content is enabling a morning news show leveraging the studio technology outlined above. Students are responsible for learning the tools, creating the copy and producing the show. At the middle and high school level, districts are specifically offering electives in Rich Media and video production.

Those electives translate directly to college majors such as the Rich Media degree offered at Elon University. The video management platform then enables that video to be distributed via the district's network to computers, smart boards and 1:1 devices while simultaneously being embedded in the schools' websites so parents can view from home. It spurs creativity but also reinforces the responsibility to produce the show. Many districts also leverage the creative tools that come with 1:1 devices to allow students to produce video book reports or small skits and collaborate between schools while simultaneously recording the content for on-demand consumption. Additionally, high school juniors are creating video applications and résumés to apply for college and jobs. Providing video tools is a critical component to building and extending a 21st century learning curriculum to the students as well as the faculty and community. Connectview is uniquely positioned to advise on the various platforms like Vbrick, Vidyo and Ramp that foster student video projects.

PROFESSIONAL DEVELOPMENT

Adopting a complex technology platform is risky, and schools are uniquely transparent and accountable to that risk. The stories of multimillion-dollar projects that never met the desired adoption curve are prevalent in every state and likely in every district. The single largest reason for failure is spending funds to invest in tools without investing in the professional development to enable the users to adequately integrate them into the curriculum. When a new IP network is deployed at a school, the installation and configuration costs, whether contracted or internally deployed, hover around 12 to 15 percent of the equipment cost. However, there is little training that needs to be provided on an ongoing basis, resulting in a reasonably stable platform that provides a predictable Total Cost of Ownership (TCO). Data Centers, Routers, Switches and storage are operational technologies that are capital intensive but have a lost annual cost to support other than software maintenance and hardware warranty. Video platforms require an approach similar to instructional based technologies like interactive whiteboards. Video requires professional development at the capture and management components while the distribution and consumption elements are not so intensive. A district should budget for and plan to spend 5 percent of the capital cost of the platform per annum on professional development and adoption services. The most successful programs average 8 to 10 percent annual spend against the original project value. That percentage comes in the form of onsite, hands-on adoption services programs that emphasize the integration of video into the curriculum. A district needs to start the process during the pre-sales design and development.

Connectview provides a unique blend of professional development. It starts at the consulting level before any equipment-based solutions are considered. We develop a comprehensive video strategy that incorporates curriculum, classroom workflow, IT considerations and program management. After the project is designed and implemented, we provide an annual adoption services program that integrates with experts in curriculum development and technology integration. Connectview provides programmatic oversight and partners with the nation's best professional development firms specializing in curriculum development. Any district considering adding video to its 21st century plan

should equally consider the consulting and professional development cost and strategy to ensure a successful adoption.

MOBILE READINESS

Adopting a video platform is a significant investment, and mobility should not be undervalued in the decision-making process. In order to adequately address the mobility challenge, it is necessary to consider de-coupling the videoconferencing and video streaming technologies because they incorporate two unique sets of protocols and considerations.

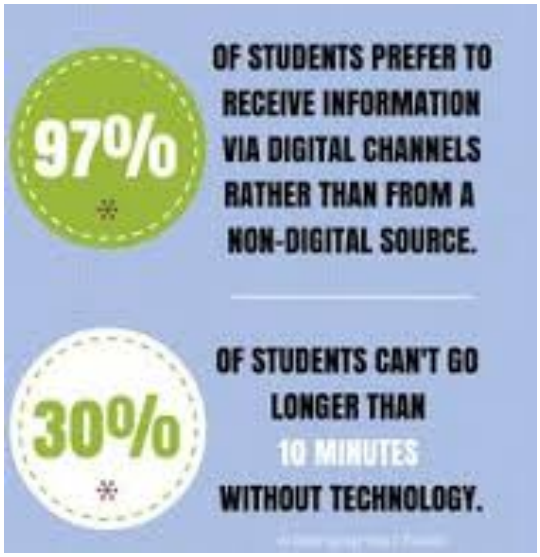
Video Conferencing/Collaboration: Video collaboration is a valuable tool for curriculum enhancement such as virtual field trips, student projects and distance learning. Collaboration is also a crowded space riddled with diverse and sometimes proprietary protocols. Historically, H.323 was the predominant protocol and is still widely used today, but it is based on a hardware intensive legacy platform rapidly being replaced by software video routing and encoding. H.264 SVC has emerged as the leader in software video collaboration, and the economics of software enables districts to scale effectively. It is also much more error resilient than legacy protocols. This enables the users to stay connected even over lossy networks and public Wi-Fi or residential networks. Vidyo is unique in the market because it delivers H.264 SVC with patented Adaptive Video Layering (AVL). It can also be delivered in a private cloud, enabling districts to off-load the bandwidth constraints of video collaboration. Moreover, districts that support 1:1 initiatives and BYOD programs need to leverage a single platform that crosses all platforms including IOS, Android, Windows, Mac and Linux.

Video Streaming: An enterprise video management platform is an invaluable tool for districts looking to deeply integrate video into the lesson plans to support curriculum. In order to truly be mobile ready, the district has to strongly consider a platform that does not require a proprietary application to be loaded on the device to consume content. A BYOD strategy that also requires access to a district supported video management platform has to provide access without disrupting the workflow of the classroom. Therefore, the platform must be accessible via a Web browser only with network authentication. Currently, Vbrick is the only platform that enables an app-less video consumption model on the LAN/WAN or public Internet. Vbrick is also the first platform that enables live streaming from an IOS device with centralized recording and distribution integration. Any school district considering a video streaming platform has to place heavy emphasis on providing access and consumption without a proprietary application on the device.

COMMUNITY AWARENESS

Awareness begets Engagement! All schools need more of both from students, parents and the community. Districts that partner with and engage the community often are among the highest performing, and the engagement begins in the facilities that are leased out to community functions and invite parents to participate in local events. Digital Signage offers a low-cost and dynamic way to foster the desired engagement from the community. It also has curriculum benefits by engaging students with test questions as they change classes throughout the day. Moreover, students are encouraged to participate and create content to be displayed, with the appropriate checks and balances.

Deploying a digital signage platform to enable engagement today leverages the "Hybrid-Cloud" model for delivery. It off-loads the content design and storage to the cloud while intelligently delivering the content to the local displays via the media player.



Connectview brings a robust software-as-a-service solution to schools that bundles software, rich media content integration, social network integration, live video and even student workflow, all while providing unlimited training and free weekly content.

Each school can integrate signs one at a time and budget annually for a fresh content. package. Fresh content is the most critical component to a successful strategy, and we make it easy to create dynamically engaging content in under 10 minutes.

NETWORK READINESS

The adoption of a centralized video platform has historically been plagued with challenging LAN/WAN requirements that inhibited IT departments from approving their adoption despite curriculum's desire to utilize them. Many video platforms used either multicast or unicast protocols for support but struggled spanning the multicast rollover and intelligent delivery methodologies. Most systems today still struggle with the intelligent distribution of video, but there are options that bridge this gap. They leverage on-premises distributed media engines to push unicast across the WAN, then convert single unicast streams to multicast at the LAN for optimized delivery to the end user while using high bandwidth LAN switching backbones compared to lower bandwidth WAN circuits. In addition to live unicast-multicast traffic conversion, the distributed media engines also optimize on-demand traffic by storing content at the edge of the network. This is particularly important for well-developed video integrated lesson plans with 1:1 access requirements.

One critical trap not to fall into is the notion that "cloud" only video delivery is the way to go. Accessing YouTube at home is not the same as on the network due to density constraints relative to concurrent utilization.

The bottleneck in a school or district will likely be at the Internet access level for many years to come, and the cost to provide bandwidth is very large relative to the distributed media engines. Poor access and buffering video will strain even the most aggressive and well-designed adoption models.

While "Cloud" has many appeals, the "Hybrid-Cloud" is the most appropriate delivery method for enterprise video management platforms.

"As we observed how much students are immersed in video, we realized that students must have exposure to the production and use of video in education to be prepared for the workforce they will become. Our growing assumptions that we can find a video online to demonstrate almost any product on the market solidifies our belief that video will always be in integral part of our students' world. Lee County Schools turned to ConnectView to help us sort out the easiest and most cost efficient video solution for our district."
-Cindy Johnson, CIO, Lee County Schools

Connectview is the leader in designing, delivering and supporting enterprise video management platforms and video collaboration platforms in the southeastern United States. We are video experts with a network background representing the industry's market-leading manufacturers at their highest partnership levels. With integration to existing platforms of record like SharePoint, LMS systems or destination portal, Connectview has built some of the largest video networks for K-12 districts.

THIRD-PARTY CONTENT

Schools, as opposed to private enterprises, uniquely subscribe to third-party video content to support their curriculum needs, and much of that content is video or animation-based moving images. When considering a video platform to manage internally produced content, also consider the integration capabilities of third-party content from market leaders such as Discovery Education, Learn 360, PD 360, Khan Academy and YouTube. Any platform that comes with all of its own content is less likely to be able to integrate to open standard third-party content, free or paid. It's also important to note that video content itself is only valuable if it is searchable via its metadata, so integration must include metadata and tags. In addition to video integration and meta tags, non-video content should be able to be associated to the video and permissions associated to copyright standards and TEACH Act compliancy.

Connectview is one of the only partners in the nation to also be partnered with numerous third party content providers such as Discovery Ed. Moreover, our solutions can integrate both on-demand AND live content into the system with bi-directional integration to YouTube. Our platforms maintain student information protection standards and network authentication thru LDAP and Microsoft Active Directory integration. We truly provide the most comprehensive and open standards based platforms available.

CONCLUSION

Any school considering a 21st century curriculum should have video integrated into every lesson every day. To achieve that goal, adopting a video platform is required to optimize delivery and support a successful classroom adoption. The most successful schools utilize a combination of video management, video collaboration and digital signage technologies throughout their instructional and administrative strategy. The strategy improves retention and engagement by 7 to 10 times over text based curriculum and takes advantage of faculty collaboration and webcasting for professional development delivery. Connectview helps schools by navigating the visual world of these three technologies and has successfully implemented them in more than 100 school districts across the Southeast. Engage Connectview to assist in planning and delivering the solutions and predictable life cycle adoption strategies to ensure your success!