Video in the Modern Classroom

Video Solutions Help Schools Reach and Teach Students More Effectively Despite Tighter Budgets

Video Extends the Classroom

Video and online media are not new to education, but they offer remarkable new capabilities for K-12. Recent research shows that innovative video technologies can both improve academic outcomes and extend the reach of education in ways that make economic sense in challenging times.

Ambitious Goals Face Dwindling Budgets

Educators face a number of obstacles, from increased pressure to improve standardized test performance to shrinking state and local budgets. In addition, instructors are leaving their classrooms for better opportunities and students' learning skills are tuned more towards social media. These challenges require that institutions transform the way they reach and teach students.

Although schools have used recorded videos for many years and some have started employing web-based video technology, most educational institutions do not understand the critical role video can play in improving quality of education despite budget constraints.

StreamVu Ed recently conducted interviews with industry experts in education, education sales, and emerging technologies to highlight the main pain points for educators. The interviews indicated that although tight budgets are always a burden, improving the educational experience for students is the main focus. Interestingly, educators' top five concerns, outlined below for K-12 and higher education, can all be answered with technology solutions.

Top Five Pain Points

K-12 Schools

1. How do schools continuously improve the quality of education under budget pressures?
2. How can school districts extend class offerings?
3. How can schools recruit, retain, and train the best teachers?
4. How can schools scale best practices and reuse technology?
5. What can administrators do to transform the way their teachers reach and teach their students?

Higher Education

1. How do administrators deal with the rising costs of higher education?
2. How do higher education institutions attract and retain quality students?
3. How can these institutions scale globally?
4. How can they maximize technology for next-generation learning?
5. What can higher education administrators do to compete in a world with traditional, international, and new-model players?

Video Meets These Challenges in Five Ways

A portfolio of video solutions goes far to meet the educational needs of both K-12 and Higher Education students and teachers. StreamVu Ed has built an interactive tool that estimates the value of a video solution portfolio in education. The model looks at two areas of value: qualitative and financial. The qualitative benefits are based on responses from the many experts StreamVu Ed interviewed as well as relative studies that measured the value of technology in education. On the financial side, StreamVu Ed built its model using data from numerous sources, including reports from the Organization for Economic Co-operation and Development (OECD), U.S Census surveys, U.S. government reports, the U.S. Department of Energy (DoE), the Advisory Committee on Student Financial Assistance (ACFSA), its own financial analysis, and knowledge based on more than 15 years of consulting with customers.

Instruction itself makes up two-thirds of the cost of education. This includes costs for faculty, textbooks, and facilities. Video solutions can lower these costs, paying for the investment in just a short time. Gartner estimates that personal computers in education can pay for themselves in five or six years.[1] StreamVu Ed has determined that the payback time for a total video solution can be as low as two years.[2]

StreamVu Ed analysis found five main drivers of economic value from video solutions:

1. **Increasing faculty reach**. Teachers and professors can reach students anywhere— even globally—without increasing travel cost. These solutions can make better use of teachers' time by moving fact-based concepts—the information they currently repeat to each new class—to video, allowing them to use in-class time for personalized training and application.
2. **Expanding the scale of faculty efforts.** Video solutions enable the best teachers for each topic to capture their lessons and lectures for use by any number of students anywhere, anytime. Schools can now bring renowned experts into any classroom through video, instead of having to pay and schedule guest speakers.
3. **Reducing textbook costs.** Moving printed content to digital devices, or replacing the content with video, reduces the cost of printed textbooks and enables immediate updates and access.
4. **Retaining teachers.** Replacing teachers is costly. After pay, teachers' main reasons for leaving their jobs is safety, the need to refresh and upgrade their own skills, and a desire to use the latest teaching tools. Integrated cameras are improving safety on campuses not only for teachers but for students as well. Webinars, video courses, and social media tools help educators improve their own career skills, and by moving typically repeated lectures to video, they have more time for personal development. StreamVu Ed estimates that video solutions can reduce teacher attrition by 15 to 20 percent.
5. **Reducing facilities costs.** Universities in particular construct buildings to handle peak loads, but classrooms often sit empty. Institutions can normalize building utilization by moving courses to laptops, tablets, and other devices off campus. This allows institutions to funnel construction costs back into already existing buildings as well as the students and teachers.

Video Provides Impressive Financial Benefits

The following case study uses StreamVu Ed research to detail the financial benefits of video for a 10,000 student university.

Figure 1. Sample Financial Returns for a Medium-Sized University.

Sample Institution

University with 10,000 students and enrollment growing at 1.6 percent annually. Concerns include:

1. Rising education costs and tuitions
2. Ability to attract and retain quality students and faculty
3. Scaling across multiple campuses
4. Competition from traditional and new-model institutions
5. Maximizing technology for next-generation learning

Applications Considered

1. Lecture capture
2. Distance learning
3. Campus communications
4. Physical safety and security
5. Linking with corporate recruiters
6. Bringing external speakers to an extended audience during large events
7. Some external research and development collaboration

Key Hypotheses

- Scale faculty by 40 percent, from 70 to 100 students per faculty member, using classrooms equipped with immersive video conferencing that is used five hours per day over three years
- Reduce the cost of creating and printing textbooks by 15 percent by moving content creation to video and using social media to distribute the content to students, each equipped with a tablet
- Increase faculty retention by 20 percent, based on an average annual attrition rate of 13 percent, by improved teaching conditions, including physical safety and security

Economic Summary

Cumulative benefits over 10 years

NPV = $38.1 million

Payback is 20 months

Gross benefits over 10 years:

- Faculty reach and scale: $90.5 million (64 percent)
- Textbook costs: $21.4 million (15 percent)
- Facilities utilization: $17.8 million (12 percent)
- Faculty retention: $12.4 million (9 percent)

Environmental impact: carbon emissions reduced by 9,400 metric tons over 10 years.

Improving Student Outcomes

Although financial challenges often grab the headlines, improving student outcomes and education is the overall goal. Measuring the impact of new technologies such as video is difficult, but studies have shown that technology in general has a very positive effect on education. For example, StreamVu Ed conducted a study in 2008 that showed significant improvements in student outcomes at institutions that installed broadband connections.

StreamVu Ed has identified seven ways in which a video portfolio can improve student outcomes:

1. **Bring in experts.** Schools can invite experts—people who wouldn't normally be available to the institution—into the classroom via immersive video technologies or recorded video. For example, a NASA engineer could address a physics class or a published author could address a writing class.
2. **Move repetitive teaching to video.** Faculty can record fact-based information that they currently teach repeatedly. Students can then study the videos before class and use class time to clarify difficult points, apply principles, and catch up on information they missed or misunderstood.
3. **Extend the classroom anytime, anywhere, to any device.** With video, students can study on laptops or tablets, at home, in a library, late at night, in the morning, and anywhere in the world. They can also view a video as often as needed to learn the content. This is a particular advantage for students with disabilities, who may require magnification of video images or who need tutoring.
4. **Standardize content from the most effective instructors**. Face it: Some instructors are brilliant, while others struggle to keep students' attention. Video allows schools to standardize on the most effective content taught by the most effective instructors.
5. **Teach in a way students are accustomed to learning.** Today's students grew up with on-demand video and the newest technology. They are right at home using these devices to learn and study.
6. **Increase the availability and impact of courses.** When you free up your best instructors' time by committing their fact-based courses to video, they can spend their time developing more courses for more students.
7. **Earn more and give back to the community.** Economic studies show, on average, that students earn more with higher degrees and improved education. Combine this with safer schools, thanks to video-based safety and security measures, and you can see that video solutions result in a positive macroeconomic impact. Better school districts are more likely to attract and retain families in their community, and students who achieve higher incomes contribute higher tax revenues. Ultimately, these video-based educational improvements benefit the broader community.

Consider a Portfolio of Video Capabilities

Let's look at available video capabilities and how they work to solve the challenges educators face:

- Next-generation immersive video conferencing brings remote presenters face-to-face with their student audiences.
- Web tools enable sharing of presentations, applications, and desktops in real time, via the device of choice, giving students a richer experience.
- A secure repository of recorded videos lets students create and share projects while teachers can produce on-demand instruction and access career training.

- Social media tools let students and faculty connect through mobile, visual, and virtual channels, allowing individuals and groups to share and collaborate across campuses.
- Digital signage replaces printed signs and manual broadcasts with real-time messages that are displayed throughout a campus, whether it be typical morning announcements or an emergency alert.
- Video can monitor a school's campus and record activities to improve physical security.
- Tablet PCs can eliminate the bulk and printing costs of physical books, as well as keep students in touch with their classes and each other.

Figure 2. Video Usage in Classrooms:

Sample School District

Average school population:

Elementary: 580

Middle: 780

High: 1100

Average IPTV Live Multi Cast Channels:

1. District Feeds: 8
2. Local Origination: 1

IPTV Live HLS Simultaneous Viewers:

	Average	Peak
1. Elementary	8	24
2. Middle	21	102
3. High	25	140

*note that peak time is morning announcements

Average Video on Demand Simultaneous Viewers:

	Average	Peak
1. Elementary	16	42
2. Middle	27	65
3. High	25	110

Key Hypotheses

- Students have personal hand held devices to access live and on demand content.
- All IPTV Channels are primary Multi Cast feeds with HLS for limited access.
- Faculty embraces the digital media library
- Each school has an internal 3-GB Network capacity.
- Multi Cast feeds are delivered at 4.5MBPS or less.
- VoD is stored and distributed at 2.2MBPS.

Considered:

- Lecture capture
- IPTV Record Capability
- Video Upload Utilized
- Distance learning
- Campus communications
- Physical safety and security
- Linking with existing LMS.
- Bringing external speakers to an extended audience during large events
- Some external research and development collaboration Communicating your message to the community