

Video Improves K-12 Education Outcomes Without Breaking Budgets

How Video Solutions Help Teachers Extend Their Reach and Effectiveness

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Video and online media are not new to education, but they offer remarkable new capabilities for K-12 school districts. Recent Cisco® Internet Business Solutions Group (IBSG) research shows that innovative video technologies can both improve academic outcomes and extend the reach of education, in ways that make economic sense in austere times.

Ambitious Goals Face Dwindling Budgets

It's no secret that K-12 educators face a number of challenges—from increased pressure to improve student performance on standardized tests, to shrinking state and local budgets.

In Texas, for example, legislators cut their budgets by 7.5 percent, and school districts are bearing the brunt of those reductions. Texas schools ran on 3,300 fewer staff members in 2011 than in 2010, and 49,000 education jobs will be lost over the following two years due to budget cuts (while student populations are growing).¹ In Kansas, teacher positions are down 4 percent since the 2008–2009 school year, yet the student population has grown about 2 percent.²

In addition, instructors are leaving their classrooms for better opportunities, and students' learning skills are tuned more to social media and new technologies than to traditional educational models. These challenges require that institutions transform the way they retain talent—and the way they reach and teach students.

Although they have used recorded videos for many years to introduce new experiences to students, and some have started employing web-based video technologies to save travel costs, most educational institutions do not understand the critical role video can play in scaling resources to improve education quality despite budget constraints.

Cisco IBSG recently conducted interviews with industry experts in education, education sales, and emerging technologies to understand the pain points for educators and to determine whether video can help address their challenges.

Educators indicated that although they are concerned about tight budgets, they care most about improving the educational experience for their students. Interestingly, K-12 schools' top five concerns, outlined below, can all be answered with technology.

¹ "Anticipating Budget Cuts, State Agencies Shrink," *The Texas Tribune*, September 27, 2011.

² "Budget cuts led to fewer teachers in Kansas schools, but enrollment continues to increase," *The Republic*, Associated Press, November 6, 2011.

Top Five Pain Points

K-12 Schools

1. How do schools continuously improve the quality of education under budget pressures?

Costs for traditional education methods are increasing while legislators and local administrators are restricting budgets. Educators want to know how they can improve outcomes in this environment.

2. How can administrators extend the classes they offer, and how can technology help?

Many school districts are eliminating elective classes. Advanced-placement and rare-language classes, among others, end up on the wrong side of the chopping block. Educators want to know whether technologies can help them save these courses.

3. How can they recruit, train, and retrain the best teachers?

Teachers in U.S. K–12 schools change jobs or leave the profession altogether at an average annual rate of 16 percent. Teachers say they want higher pay, better safety for themselves and their students, more modern teaching capabilities, and time to refresh their own skills. How can K-12 schools maximize technology for next-generation learning?

4. How can schools scale best practices and reuse technology?

When schools invest in a technology, they want to understand how to maximize their investments by using the technology and practices across the educational system.

5. What can administrators do to transform the way their teachers teach and their students learn?

Schools have too often purchased technology only to find it underused. The reason is that technologies require a transformation in education. You can't install a camera in a classroom in Topeka, Kansas, and expect that students will automatically begin interacting with students in Mumbai, India.

Video Meets These Challenges in Five Ways

A portfolio of video solutions goes far to meet the needs of K-12 schools. Cisco IBSG 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 Cisco IBSG interviewed as well as relative studies that measured the value of technology in education. On the financial side, Cisco IBSG built its model using data from numerous sources, including Organisation for Economic Co-operation and Development (OECD) reports, 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.

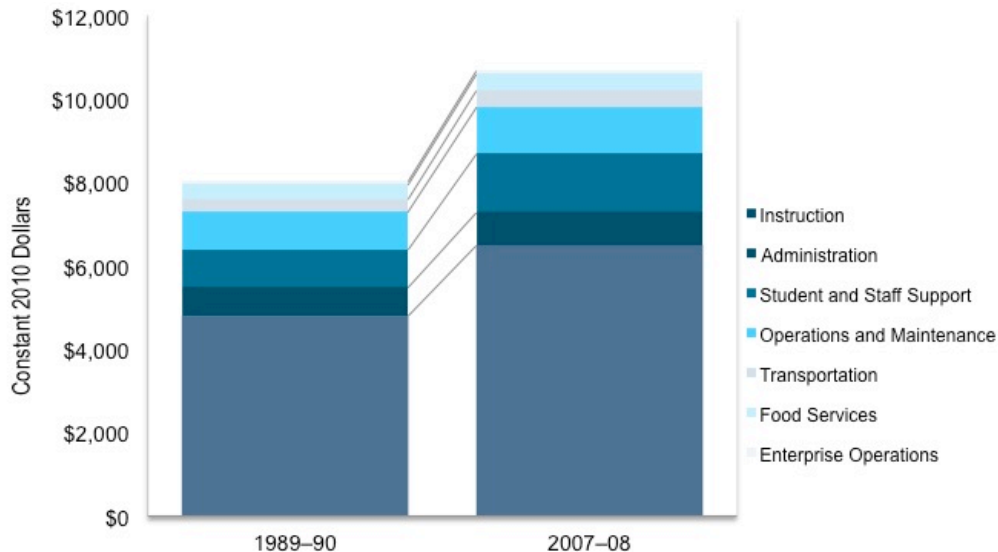
Instruction itself makes up two-thirds of the cost of K-12 education. This includes costs for faculty, textbooks, and facilities. Video solutions can lower these costs, paying for the investment in a short time. Gartner estimates that personal computers in education can pay

for themselves in five or six years.³ Cisco IBSG has determined that payback for a total video solution can be as low as two years.⁴

In fact, many cash-strapped schools are already turning to video at a rapid rate to provide virtual schooling. In 2011 more than 250,000 K–12 students were enrolled full time in virtual schools across the United States, an increase of 40 percent over three school years. And these programs aren't restricted to a few progressive districts, as 30 states hosted full-time online school programs in 2011. In addition to saving money, the schools cite variety and flexibility as major draws to online learning. Teachers in the Florida Virtual School answer questions by email, phone, recorded videos, and live web-based conferences.⁵

Where most institutions look at replacing travel with video as a tangible measure of value, these virtual schools and Cisco IBSG found that travel represents a minor savings. The most impressive savings come from increasing faculty reach, expanding the scale of faculty efforts, reducing the cost of textbooks, retaining rather than recruiting teachers, and lowering the costs of facilities.

Figure 1. U.S K-12 Public School Expenditures per Pupil per Year, in Constant 2010 Dollars.



Source: U.S. Department of Education, Institute for Education Science, NCES Condition of Education report, 2010; Cisco IBSG, 2011

Cisco IBSG analysis found five main drivers of economic value from video solutions:

1. **Increasing faculty reach.** Teachers can reach students anywhere—even globally—without increasing travel costs. 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 their in-class time for catch-up and application.

³ Gartner Research, 2003. In the winter of the 2002–2003 school year, four school districts participated in a Total Cost of Ownership (TCO) of Distributed Computing project commissioned by the Consortium for School Networking, with the sponsorship of the U.S. Department of Education and NCREL.

⁴ Cisco IBSG analysis was calibrated based on the West Texas A&M University portfolio of video solutions, using the Cisco IBSG *Video Value in Education* tool.

⁵ NBC Nightly News, November 27, 2011.

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. Not only can the best teachers reach students anywhere, but they can also bring renowned experts into any classroom by video. Teachers can use their time to create more course materials. Learning is also no longer limited by school or library hours, and students can study and repeat material anytime. Ultimately, these advantages can help school districts attract more quality students.
3. **Reducing textbook costs.** Moving printed content to digital devices such as tablets, or replacing the content with video, reduces the cost of printed textbooks and enables immediate updates to content.
4. **Retaining teachers.** Replacing teachers is costly. After pay, teachers' main reasons for leaving their jobs are 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. Webinars, video courses, and social media tools help educators improve their own career skills, and by moving fact-based lectures to video, they have more time for personal development. Cisco IBSG estimates that video solutions can reduce teacher attrition by 15 to 20 percent.
5. **Reducing facilities costs.** Institutions can normalize building utilization by moving courses to laptops, tablets, and other devices off campus.

Improving Student Outcomes

Although financial challenges often grab the headlines, improving student outcomes 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, Cisco IBSG conducted a study in 2008 that showed significant improvements in student outcomes at institutions that installed broadband connections.

Figure 2. A 2008 Cisco IBSG Study Showed that Technology Improves Student Outcomes Significantly.⁶

Subject	Improvement
First language	13%
Math	2%
Science	56%
Geography	37%
History	3%
Modern languages	82%
Design and technology	41%

Source: Cisco IBSG, 2008

Cisco IBSG has identified seven ways in which a video portfolio can improve student outcomes:

⁶ "Costs and Benefits of National Connectivity," Cisco IBSG, April 2008.

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 Nobel laureate could address classes of physics students. The Darla Moore School of Business at the University of South Carolina, known for its outstanding leadership in international business education, installed both immersive video and web-based conferencing that connected Organization Design students with executives from NBC Universal in New York.
2. **Custom-fit education to the student.** 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. Professors and instructors at Touro College in New York City record their lectures and post them online for students to access whenever and as many times as they choose.
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. MyeAcademy provides college-bound students with instruction to improve their scores on the SAT Reasoning Test. The school installed web-based conferencing and uses it with presentations, video, pictures, and graphics. "Some of our students were saying they couldn't believe they could learn 40 to 50 words in an hour, but they did," said De-Yin Jeng, MyeAcademy vice president.
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. In the Cleveland County (North Carolina) Public Schools, "video-based instruction enables us to offer two AP courses in a school where only a few students were interested," said Rob McDaniel, network engineer. "We can't justify the \$50,000-plus salary for a teacher for a few students, so without the video solution, these students would have missed the AP opportunity."
5. **Teach in the way students are accustomed to learning.** Today's students grew up with on-demand video and technology, and are right at home using these to learn. The Mobile County (Alabama) public school system is using digital media to improve learning and community relations. A digital sign in the lobby of each school shows parents and visitors student-created videos, student profiles, a weekly 30-minute program, an accomplishments scorecard, PTA and other announcements, budget information, and live graduations.
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. Chapin Hall at the University of Chicago offers three to four webinars per year on topics ranging from responsible fatherhood to foster care best practices. Each event features a different presenter, and the events are recorded so people can attend whenever they have the time. Audiences for events have grown from 200 people per "live" event to about 600.

7. **Earn more and give back to the community.** Economic studies show that on average, 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. The Moss Point School District in Mississippi installed a network-based security system, beginning with IP video surveillance. The system allows the district stop fights, quickly identify students who damage vending machines, and keep an eye on stored equipment. The results are safer school grounds and a deterrent to vandalism and theft. Students even drive more safely in the high school parking lot, knowing a camera is monitoring their behavior.

Consider a Portfolio of Video Capabilities

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

- Next-generation, immersive video conferencing brings remote presenters face-to-face with their student audiences.
- Web tools that enable sharing of presentations, applications, and desktops in real time, via the device of choice, give students a richer experience.
- A secure repository of recorded videos lets students create and share projects, and 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, teams, and classes to share and collaborate across campuses and globally.
- Digital signage replaces printed signs and manual broadcasts with real-time messages that are displayed throughout a campus.
- 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.

West Texas A&M University Makes the Transformation

West Texas A&M University (WTAMU) in Canyon, Texas, near Amarillo, has adopted pervasive video to help its student population grow from 8,000 today to 10,000 within three years, create real-time communication with and among students, increase collaboration on campus and around the world, and improve the safety and security of its students and faculty. It is one of the most video-enabled educational institutions in the United States.

Video allows students to capture homework assignments, professors to record lectures, administrators to broadcast messages across the campus, and security personnel to monitor incidents in real time.

Through a social media portal, students collaborate with others on campus and around the world. For example, students in Texas, Germany, and Russia posted a video in which two Russian students spoke in English, and the students in Texas spoke in Russian.

The university has increased its online offerings, resulting in a 10 percent increase in distance learners. It also offers a Virtual Math Lab (VML) free to any student in the world, and the lab experienced 6.6 million unique hits in 2010.

Students, faculty, and administrators have all adopted the technology at an amazing rate and are creating content in “incredible” ways, according to James Webb, WTAMU’s chief information officer (CIO). The university uses more than 100 digital signs throughout the campus to deliver time-sensitive information pertaining to athletic events, career placement, university functions, and messages specific to certain parts of the campus, such as construction or maintenance disruptions. The university is also phasing in IP security cameras alongside its existing analog cameras to track and share incidents instantly via any video-enabled device, including PCs, mobile devices, and digital displays.

Estimating the Economic Opportunity in Your Institution

Cisco IBSG created a *Video Value in Education* tool to help educational institutions understand the potential impact of a video portfolio. Cisco IBSG has tested this tool with customers, who validated that it is accurate and provides essential information to help them understand the benefits of a video portfolio.

Following is a brief overview of the process you will go through when using this tool. The tool first helps you determine objectives that can be addressed by video. For example, you will rate whether improving outcomes under budget constraints is a high, medium, or low concern.

Inputting Your Goals

Figure 3. Rate These Common Concerns and Others that You Define Based on Their Impact on Your Institution.

CISCO Video Value in Education Scenario

Steps: 1. Goals | 2. Use Cases | 3. Solutions | 4. Benefits | 5. Financials | 6. Qualitative | 7. Calibration

Step 1: Select your Education segment, identify key careabouts and concerns

Segment: **Higher Education** Student enrollment: **10,000**
Annual growth: **1.0%**

Key careabouts and concerns:

- High** Medium Low Rising education costs, profitability
- High** Medium Low Attract and retain quality students
- High** **Medium** Low Scale globally
- High** Medium Low Competition from traditional, international, new model players
- High** Medium Low Maximize technology for next-generation learning
- High** **Medium** Low Facilitate new teaching paradigms [do more with less]
- High** Medium Low ...

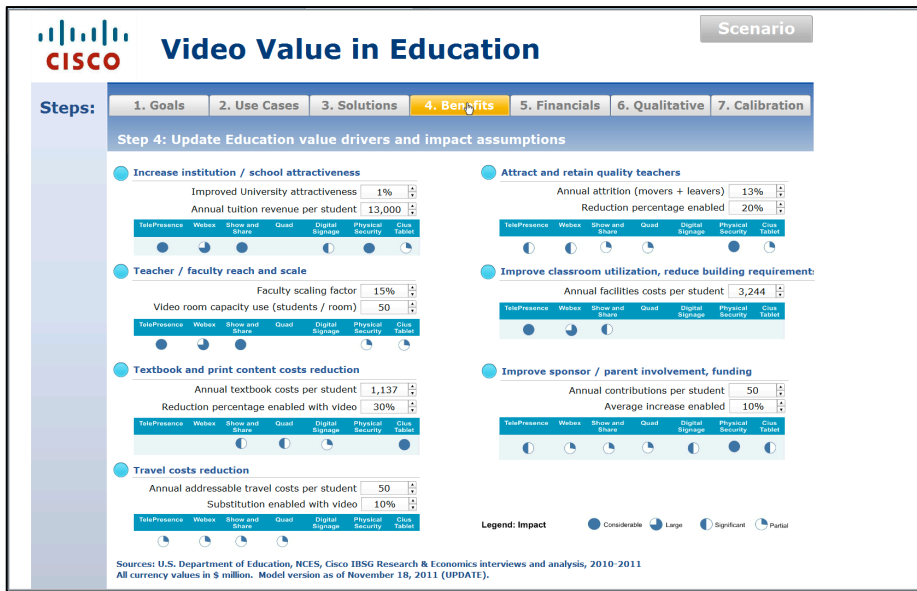
Sources: U.S. Department of Education, NCES, Cisco IBSG Research & Economics interviews and analysis, 2010-2011. All currency values in \$ million. Model version as of November 18, 2011 (UPDATE).

Source: Cisco IBSG, 2012

Next, you will determine various scenarios, or “use cases,” that are most appropriate for your institution. For example, if testing has shown that your school needs to improve, you may select “Remedial classes,” and the tool will include this in the benefits calculation. The tool will also show the video solutions that can have the most impact and let you decide which outcomes are important.

Understanding the Economic Impact of Video For Your Institution

Figure 4. Video Solutions Contribute to Solving Concerns in Various Degrees.

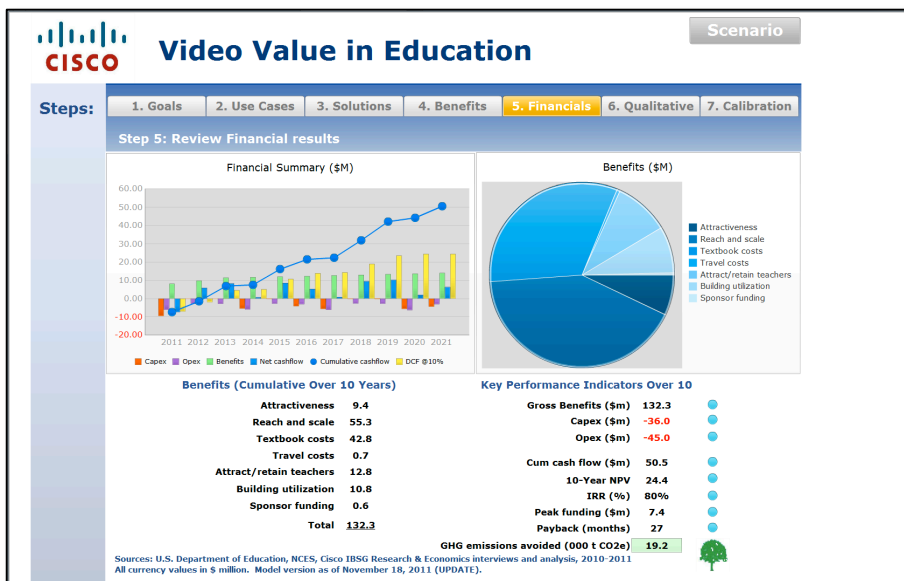


Source: Cisco IBSG, 2012

The *Video Value in Education* tool can help size the impact of video applications in your institution with key financial implications over time. It also shows the relative impact of each benefit driver. The tool adjusts the value of these benefits based on your particular inputs—or you can use the assumptions from Cisco IBSG’s research.

Experiment To Get the Right Benefits

Figure 5. Financial Benefits Can Be Significant When You Employ a Full Video Solution Portfolio.



Source: Cisco IBSG, 2012

This is a “what if” tool that lets you go back and change any of the inputs on the previous tabs and view the effect of the changes.

Conclusion and Next Steps

Educational institutions face tremendous pressure from rising costs, tightening budgets, and demands that they deliver better education in a world where students—and even the institutions themselves—face competition from around the world. Based on extensive interviews and research, the Cisco IBSG *Video Value in Education* tool can help you gauge potential benefits for your institution, both financially and qualitatively.

For many educational institutions, video makes immediate sense, because it enables them to scale faculty and classes while offering tremendous cost-saving opportunities. However, adoption may need to be gradual. With this in mind, decision makers should evaluate the best approach for their own needs.

To help with your evaluation, Cisco IBSG offers the following roadmap:

1. **Determine whether your institution is ready to consider video adoption.** The first step for any educational institution is to assess its readiness. Key elements to consider are possible cultural challenges, such as the intellectual property of class content, student appetite for online classes, and credibility implications. You should also consider the capabilities of your current IT infrastructure.
2. **Analyze the opportunity by understanding your goals for video and how you will apply video in your institution.** Decision makers should consider the most critical pain points, such as budget constraints or plans to expand across multiple campuses, along with the applications or use cases to address the pain points. Consider the level of interaction necessary to create your next learning environment and how distributed your students are geographically. You should select the applications and use cases that offer the greatest opportunity, both in terms of potential benefits and faculty and student adoption.
3. **Assess the video IT capabilities that are required to support these applications, and determine which video opportunities provide the most immediate benefits.** With these goals and applications in mind, determine the portfolio of video capabilities your institution needs. Some classes or faculty-student interactions may require immersive video capabilities, while others such as fact-based learning may simply require online video. Decision makers can then weigh the economic value and readiness of stakeholders, focusing on those applications and use cases with the highest immediate potential. For example, you may decide to use video for professional training, campus recruitment, and lowering the costs of some fact-based lectures.

By following these steps and using the Cisco IBSG interactive tool to estimate the impact on your institution, the benefits of video-based transformation will be within your reach.

More Information

Cisco IBSG (Internet Business Solutions Group) drives market value creation for our customers by delivering industry-shaping thought leadership, CXO-level consulting services, and innovative solution design and incubation. By connecting strategy, process, and technology, Cisco IBSG acts as a trusted adviser to help customers make transformative decisions that turn great ideas into value realized.

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