

Video Extends the Classroom

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

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Video and online media are not new to education, but they offer remarkable new capabilities for both K-12 and higher ed. 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

Educators face a number of challenges, from increased pressure to improve student performance on standardized tests to shrinking state and local budgets. 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, educators' top five concerns, outlined below for K-12 and higher education, can all be answered with technology.

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 educational 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 needs of education in both the K-12 and higher education arenas. 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 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 them-selves in five or six years.¹ Cisco IBSG has determined that payback for a total video solution can be as low as two years.²

Cisco IBSG 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 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.
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.
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

¹ Source: 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.

² Source: 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.

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.** 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.

Video Provides Impressive Financial Benefits

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

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

<p>Sample Institution</p> <p>University with 10,000 students and enrollment growing at 1.6 percent annually. Concerns include:</p> <ol style="list-style-type: none"> 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 <p>Applications Considered</p> <ol style="list-style-type: none"> 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 	<p>Key Hypotheses</p> <ul style="list-style-type: none"> • 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 <p>Economic Summary</p> <p>Cumulative benefits over 10 years NPV = \$38.1 million Payback is 20 months Gross benefits over 10 years:</p> <ul style="list-style-type: none"> • 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) <p>Environmental impact: carbon emissions reduced by 9,400 metric tons over 10 years</p>
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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.

Cisco IBSG 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 Nobel laureate could address classes of physics students.
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 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.
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 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.

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 2. 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 ...

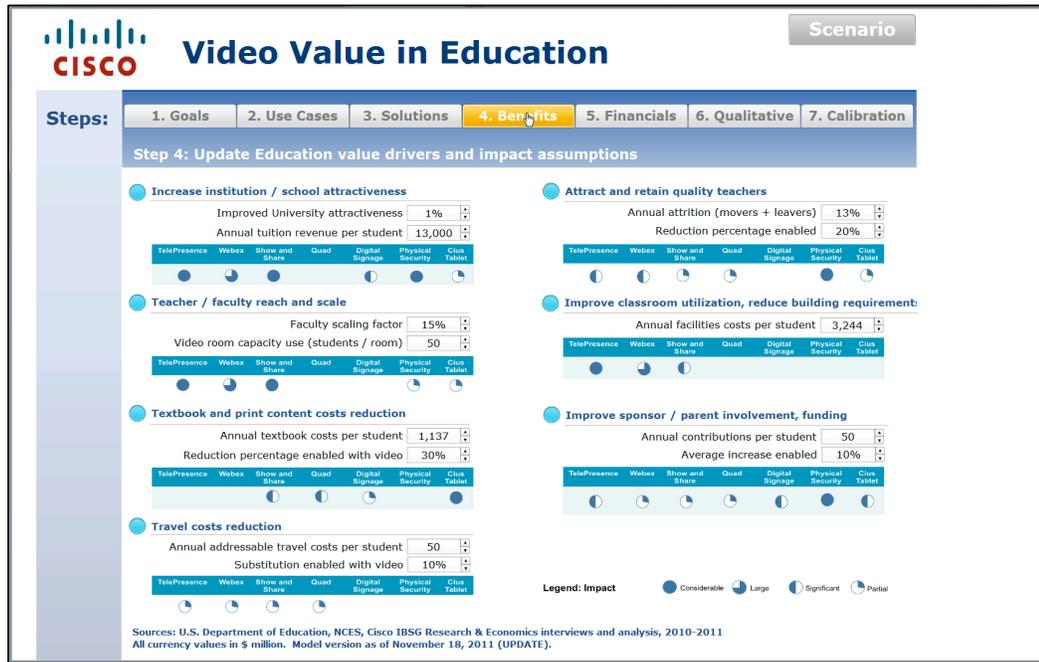
Sources: U.S. Department of Education, NCES, Cisco IBSG Research & Economics interviews and analysis, 2010-2011. All currency values in \$ million. Model version as of November 18, 2011 (UPDATE).

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 3. Video Solutions Contribute to Solving Concerns in Various Degrees.

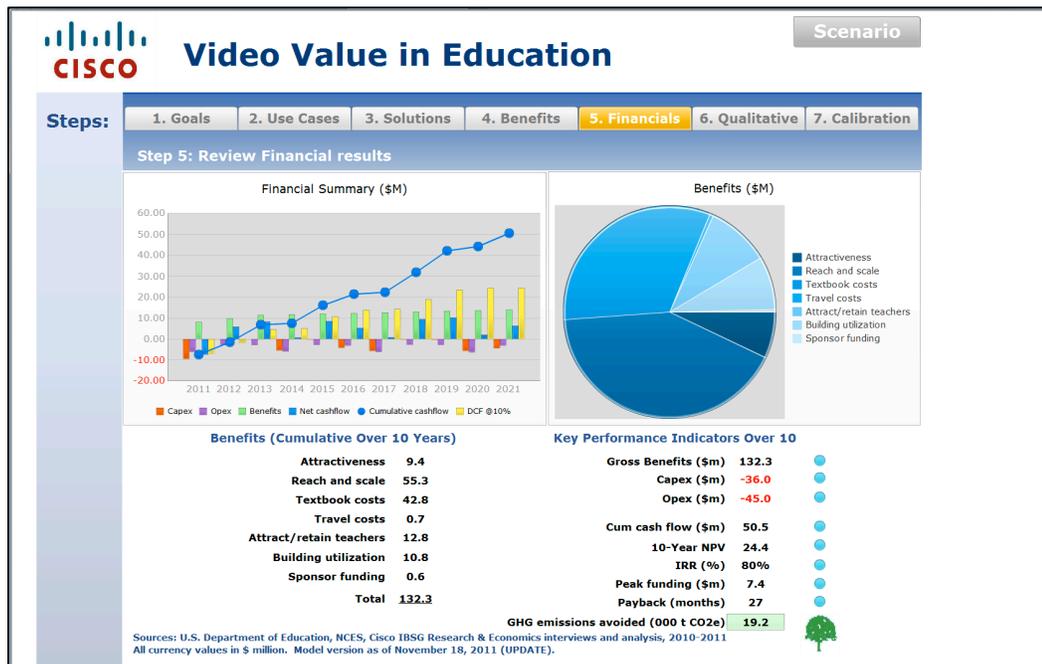


Source: Cisco IBSG, 2012

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 4. 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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