A STRATEGY PAPER FROM

CENTER FOR DIGITAL EDUCATION

Video Collaboration in Education:

Building a Foundation for the Digital Age

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Introduction

It's 4 a.m. in Alaska — not a time when you expect many people, much less teenagers, to be awake. Yet, about 100 eager sophomore world history students are gathered in three high schools spread across the Kenai Peninsula on Alaska's southern edge, excitedly looking at video screens mounted on their classroom walls.

The teens are here to connect with students from the Arab Minority school in Nazareth, Israel. They are joined by students in schools in Louisiana and South Dakota. For an hour, a moderator in Manhattan bounces the conversation back and forth, pinging questions from school to school as the students get to know a little more about each other and the different — and similar — worlds in which they live.

"It was so cool," says Emily Evans, a 16-year-old in Greg Zorbas' world history class at Kenai Central High School. The students from Israel "thought so highly of us because we were from America."

Now, says Evans, when the Middle East is a topic in school, "it's a lot more interesting. Before it was just, we're reading a book on it and it's not very real to us. But it's real and you can see them and talk to them and see firsthand how it is. Now I pay more attention in history class."[1]

The videoconferencing session Evans and the other students experienced is the type of video communication that is becoming more common in education at all levels around the world, as the walls between classrooms disappear. This Center for Digital Education white paper shows how video collaboration is an essential part of the K-20 education environment that enables cost savings, engages students and creates a more productive learning experience. It prepares students with the skills to thrive in a future workforce that will depend on video collaboration technologies. Indeed, today's video collaboration is rapidly moving from a "nice to have" classroom enhancement to a "must have" necessity.

What does video collaboration look like today?

More mobile — No longer does video collaboration require highly equipped teleconferencing suites with banks of equipment. Thanks to the advent of mobile technology, learners and instructors today can videoconference with the click of a button on their smartphones, tablets, laptops or other mobile devices, no matter where they are located.

Network/device-agnostic — Today's video collaboration is network/device-agnostic: Users don't have to use a particular operating system. Both stationary and mobile devices come in a variety of platform flavors, yet users of all types are able to meet in virtual video space.

On-demand — Setting up videoconferencing doesn't require an engineering degree; modern systems are plug-and-play, with industry-standard protocols allowing seamless connection to other videoconference systems worldwide.

Synchronous or asynchronous — Video collaboration can be done in two ways: synchronously and asynchronously. The former type occurs in real time, such as a live lecture where learners and instructors can provide instant feedback and interact. Asynchronous video collaboration is a videoconference that has been recorded, such as a self-paced lesson that can be downloaded or streamed to mobile or other devices.

High-quality HD — Thanks to 4G communications and other technological improvements, HD video today is usually free of buffering lags, skips, freezes and fuzzy signals.

The Opportune Time

The shift in the education landscape toward video collaboration is occurring due to a number of factors.

Mobility

Learners are increasingly mobile. Almost two-thirds of students aged 10 to 12 and 90 percent of those 14-17 have a cellphone,[2] while smartphone usage is at 44 percent for high schoolers[3] and 49 percent for college students.[4] Tablet computer use is also soaring. Project Tomorrow found 10 percent of high schoolers had access to a tablet in 2010, while 2011 Pew Research revealed 12 percent of adults aged 18-29 had the devices.[5] These numbers are likely even higher today, given the massive influx of such devices in the market during the past 18 months.

Distance and Blended Learning

Distance and blended learning initiatives continue to grow. In the United States alone, the number of higher education students taking at least one online course in the fall 2010 term surpassed 6 million, with nearly one-third of all higher education students taking at least one online course. Online learning is growing by 10 percent annually (compared with 2 percent higher education growth overall).[6]

Bring Your Own Device

At the K-12 level, students are bringing their own devices to school and schools are beginning to allow them to be used in class. This practice, commonly known as "bring your own device" (BYOD), is much more common in higher education, where students are responsible for their own technology; it is a newer concept in the K-12 arena. However, districts that can't afford to provide devices for 1:1 learning are beginning to let students provide their own (and then pursuing a variety of strategies to similarly equip students who do not have them). No hard numbers are available for the number of districts allowing devices (administrative opposition still remains fairly high, according to the Project Tomorrow survey), but a clear majority of parents (up to 70 percent) say they are likely to buy a mobile device for their child to use in school.[7]

Increased Access

Video collaboration applications are now available on mobile devices from a variety of vendors and service providers, ranging from no-cost stripped-down models to HD-quality connections with an array of sophisticated service options. Today's technology — coupled with fast broadband Internet — has made fuzzy, unreliable videoconferences a thing of the past.

Why Video Collaboration is Essential to Education

Video collaboration provides many benefits for learners, faculty, administration and campuses. Among them:

- Classroom experiences and learning opportunities are enhanced. Students have the chance to participate in cross-cultural exchanges, speak other languages, interview subject-matter experts and participate in virtual field trips. Learning becomes more collaborative, personalized, interactive and informal, and is more likely to become inquiry-based, a model that is typically more relevant and meaningful for students.
- Equity in access is achieved for students who are too ill to come to school, live remotely or who are traveling. Campuses can also expand services to current students and alumni by allowing greater student enrollment, increasing access to career services and connecting with alumni no matter where they end up.
- Student achievement is likely to improve. Studies show learners who participate in videoconferencing have higher scores on cognitive indicators and are more motivated to learn not just the material being presented, but also to find out more about related topics.[8] In general, video has been shown to improve learning by up to 400 percent.[9]
- Instructors have more opportunity to participate in professional development workshops, seminars and collaborative activities when they can do so via video rather than having to take a day or more off to travel to another location. This allows more instructors to take advantage of additional training. Administrators and other personnel similarly can take advantage of continuing education,

professional development and other types of meetings, saving campuses money in travel and lodging costs.

- Campuses using BYOD strategies can take advantage of mobile students, instructors, experts and others and bring them together for sessions held off campus. Students on a field trip, for instance, can use mobile video collaboration applications to communicate with each other or their instructors. Students can work on research projects or other fieldwork via video collaboration.
- Distance learning is enhanced by virtual face-to-face encounters, rather than text-only ones. A 2010 meta-analysis by the U.S. Department of Education found that learning that includes both face-to-face and distance elements is the most effective type.[10]
- Students can practice skills they will need in the workplace. One survey found that over half — 54 percent — of business professionals surveyed in 2010 spoke via videoconference.[11] Video-enabled tablet use also is growing in the business world; Gartner Research reports that 92 percent of Fortune 500 companies were testing or deploying tablets in 2011, and by 2015, 90 percent of enterprise tablets will be video-enabled, further fostering the use of mobile video collaboration. Gartner estimates that by 2015, 900 million tablets and 982 million smartphones will ship annually.[12] But even sooner — by 2013 — emerging technologies such as HTML5, RTC and SVC will make video collaboration browser-based and inherently mobile.

Video Collaboration Improving Education Around the World

From Alaska to Australia, the Middle East to New York — indeed, throughout the world — video collaboration is enhancing K-20 education. Case studies show a wide variety of uses and benefits for this tool, which increasingly is being used on mobile devices.

Kenai Peninsula Schools, Alaska

As described at the beginning of this paper, three high schools in the Kenai Peninsula in south central Alaska connect with each other via videoconference for world history class, which its teachers have dubbed CWOW, or Classroom Without Walls. The schools not only do this for special events, like the Global Nomads opportunity that paired them with a class in Israel, but also meet on a regular basis. Students spend about a third of their class time in virtual instruction and collaboration. The world history class is team-taught by teachers Greg Zorbas at Kenai Central High School, Gregory Weissenberg at Soldotna High School and Rob Sparks at Skyview High School.

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>
> - Greg Zorbas, Teacher, Kenai Central High School, Alaska

Video collaboration, says Zorbas, "is absolutely a 21st-century skill — it's really powerful. My sophomores are going to be ahead of the game when it comes to college or doing a job interview via videoconference."

Students from the three schools work together in small teams using Google Docs and other shared apps to create current events projects and present them via videoconference. This allows instructors to assess not only their academic work but also their ability to communicate and collaborate via videoconferencing, says Zorbas. They use cellphones to text questions during teacher presentations (which Zorbas found improved engagement even further).

CWOW has helped a student ill with leukemia continue to attend class from home. Students on vacation have — by request — connected using their mobile devices to their CWOW classroom. "Students haven't wanted to miss my class," says Zorbas.

The teachers have benefited as well, says Zorbas, by seeing how they each teach and by dissecting what worked and what didn't work, helping each other become better teachers. "I've been doing this for 20 years," says Zorbas, "and I've never been more excited about my job."[13]

The Manhattan School of Music (MSM)

MSM is an internationally renowned music conservatory in New York offering bachelor's, master's and doctoral degrees. The school is a video collaboration pioneer, having started using the technology in 1996 to allowing traveling faculty musicians to continue to teach students. The conservatory takes advantage of tools to optimize the reception and transmission of high-fidelity music and, in recent years, has added mobile video collaboration to its repertoire.

"I'm extremely excited about the revolution of mobility," says Christianne Orto, associate dean and director of recording and distance learning at MSM. "This whole idea of being able to connect anytime and anywhere through a mobile device also gives greater flexibility for our faculty who need to teach at a distance."

Some ways the school uses video collaboration include:

- **Teaching remotely** — Either the instructor or the student or both can now be in locations other than the Manhattan studio. Before mobility, MSM faculty performing around the globe would use partner facilities, such as other universities, to connect to the school's video-enabled distance-learning music studio. Mobile devices now allow anyplace connections.

  Internationally renowned American baritone and distinguished visiting artist/MSM trustee Thomas Hampson, for instance, works with MSM students from wherever he is performing, which could be anywhere in the world. "I can be in Zurich and log into our studio in New York, and I can work very effectively with students," he says.

  Faculty can also mentor students and assess their performance in other locations. For example, a student vocal jazz group at Omaha Central High School in Omaha, Neb., received coaching sessions from composer and conductor Nathan Hetherington, who spoke to them via videoconference from his faculty studio at Manhattan School of Music.[14]
- **Remote auditions** — Students have been able to audition remotely on a case-by-case basis (the school is exploring opening this up as an option on a large-scale basis, which would especially benefit its students in Asia and other locations). Auditioning via live videoconference is widely preferred by faculty and students over videotape for reasons of integrity (in other words, there can be no doubt who is singing or playing an instrument, and the sound can't be "doctored"), says Orto.

Today, the school does videoconferencing on a daily basis. "Yesterday we went to Denmark, Monday to Finland, this morning to Nebraska," says Orto. Orto believes that video collaboration is highly essential on a number of levels. "Education is not within four walls anymore. Videoconferencing enables us to connect with peers around the globe. It allows us to develop more highly trained, better prepared musicians. It enables international collaboration. We're really building a global network of professional teaching artists and worldwide learners that is quite exciting."[15]

Wayne-Westland School District, Mich.

Students at the Wayne-Westland School District in Westland, Mich., have used video collaboration to witness live surgical procedures and confer with doctors at a hospital at Ohio State University; shared techniques about the house they were building with students in Texas by walking around the construction site with a video-enabled laptop

and wireless card; interviewed authors whose works they were studying; and gone on numerous virtual field trips to museums and zoos.

Wayne-Westland has had videoconferencing in place for 10 years. Initially, conferences were held at their career-technical center in an auditorium-styled room that seats 100 and is fitted with five to six voice-controlled cameras. Students, faculty and others who wanted to videoconference traveled to the career technical school in which the auditorium is housed.

Several years ago, the district began using a mobile videoconferencing device borrowed from its local Regional Educational Services Agency. Its use was so great, however, that the district decided to invest in its own mobile equipment. Within the past year, nearly 500 classrooms across the district have been upgraded with short-throw data projectors, audio enhancements and high-definition Web cameras, while the district has adopted a central management system to facilitate videoconferencing on its network. The entire solution was covered by federal grant monies, says Kevin Galbraith, executive director of technology for the district.

The most surprising challenge of the new technology so far, says Galbraith, is that teachers find it so easy to set up videoconferences that they are doing it without going through his office first ("which is a nice problem to have," he says). Teachers have been trained on the equipment and lesson integration, and the number of videoconferences — already relatively high for a school district in his region — has soared.

"Last year, we did about 100 videoconferences. This year, within the first semester, we are already close to that," says Galbraith. "It has exceeded our expectations. We expect in the next two years, we could have dozens of concurrent conferences going on every day in the district."

Teachers' imaginations have been sparked as they see new ways to enhance learning via technology. The district also has been able to be creative in how it uses video collaboration for professional development. Now, instead of sending one or two teachers to a conference, says Galbraith, the district is investigating bringing the speaker to the district for a videoconference that all teachers can attend.

"If we're talking about how we have a global economy, thinking your educational experiences have to occur within the four walls of your classroom doesn't match up well," says Galbraith. "We've been able to, with very minimal cost, provide learning experiences we hadn't been able to before."[16]

Other video collaboration examples from around the world include:

- The University of Northern Iowa (UNI) uses mobile devices for student teacher assessment in the field. Assessments or teaching sessions are also recorded for later review. As they address the latest focus on STEM statewide, UNI hosted the Governor's STEM Summit initiative. Attendees participated by videoconferencing and streaming, utilizing mobile devices. The president of one of the community colleges delivered a keynote address remotely from his tablet.[17]
- Residents of the Gippsland region in southeastern Australia learn how to care for cattle via laptop webcam — thanks to a videoconference arrangement that brings trade skills to the remote region. Instructors can work with multiple classes of learners remotely, using mobile devices (an instructor can give a hands-on welding lesson while wearing a helmet fitted with webcam on top). This type of visually collaborative learning allows learners to study in fields such as agriculture, construction or engineering without having to leave home, preventing "brain drain" and helping the local economy.[18]
- Academic researchers attending a technology conference in Arlington, Va., in 2010 were able to use visual collaboration tools to virtually travel to the proposed Deep Underground Science and Engineering Laboratory — located a mile underground in South Dakota, some 1,500 miles away.[19]
- Jimma University in Ethiopia had trouble securing skilled faculty until it leveraged the resources found in other universities in the developing nation. Jimma began connecting to nine other universities via VPN in 2008,

allowing for videoconferencing that brought instructors virtually to its students. The technology also enhances distance education for off-campus students.[20]

What's on the Horizon?

The Open Visual Communications Consortium is a not-for-profit organization comprised of service providers and managed solutions providers in the video communications industry. Its purpose is to develop a standards-based network specification for video communication that will enable the technology to be interoperable, so it will work universally across platforms, including mobile, as well as from provider to provider and country to country. This will foster the development of ubiquitous global video communication. The consortium plans to have an interoperable network and commercialized service in place by the second quarter of 2012.[21]

Already, video communication is moving to the cloud, allowing educational institutions to use this service to more economically and efficiently deliver mobile video collaboration to students, faculty and administrators. Web-based video chats across all segments, including education, are expected to grow 14-fold to more than 140 million by 2015.[22]

This and other consortia make it easier for educational institutions to connect, bring a guaranteed quality of service for video collaboration, and reduce concerns about type of device or network. Service providers will also play an increasing role in the mass deployment of video as a service.

Conclusion

As we have shown in this paper, video collaboration expands the reach of education. Walls mean little; oceans even less. Barriers of time and of place are breaking down, allowing students to learn in much different and more profound ways than ever before. Not only is learning more flexible due to mobile video communication solutions, but it can be eye-opening and life-altering as students experience new worlds, new ideas and new possibilities.

Truly, video collaboration is more than just a "nice to have" technology in education. Today, it is essential to improving student achievement and preparing them as professionals in the global economy.

Endnotes

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Lorna Collier

Lorna Collier has written about education and technology for the Chicago Tribune, THE Journal, Learning Solutions, the National Council of Teachers of English Chronicle, MSN Encarta, ATT.net, and many others. She is the former online editor for GetEducated.com, a website focused on distance learning.