

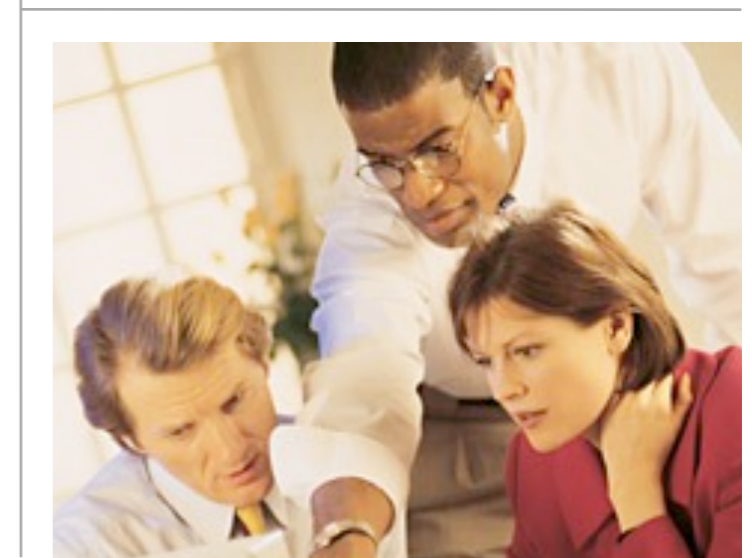
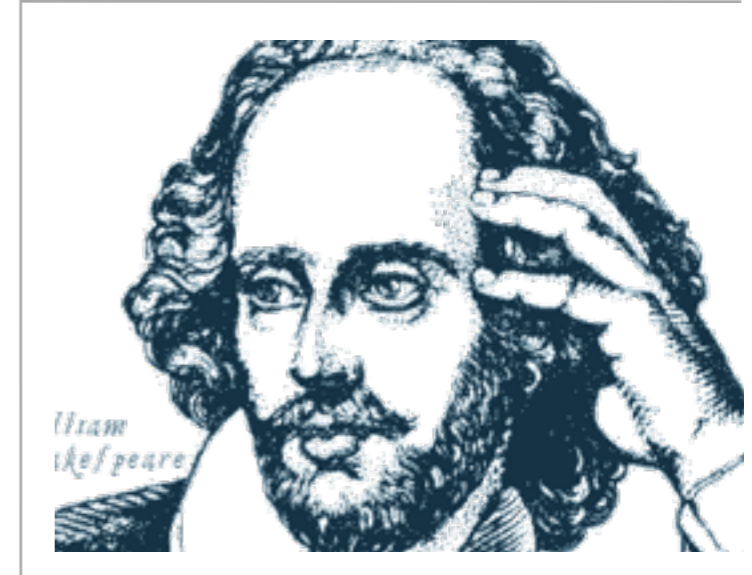
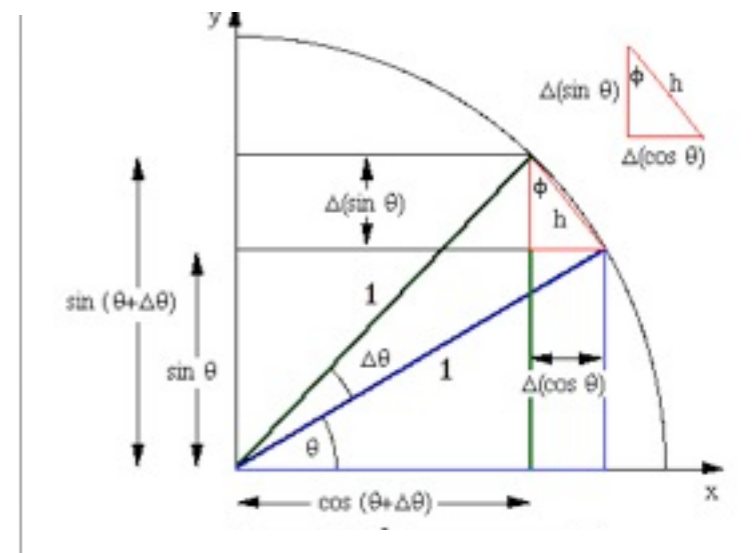
# WebEx in Education

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Four scenarios



This presentation describes four applications of WebEx to teaching and learning in schools and colleges. The examples are hypothetical, designed to illustrate the different ways that WebEx might contribute to educational improvement.  
Prepared by James G. Lengel of the Hunter College School of Education of the City University of New York. [jim@lengel.net](mailto:jim@lengel.net)



Four scenarios: math, Shakespeare, science, and staffing

You'll see WebEx at work in high school calculus, in science research, Shakespearean drama, and a special ed staffing.

# Distance Calculus

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- Rural school
- AP Calculus
- No qualified teacher



## Scenario #1: Distance Calculus

Only four students at a rural High School were interested in and qualified to take Advanced Placement Calculus this year. And since their math teacher was out on maternity leave, no one was left to teach this AP math class.

# Distance Calculus

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- Remote school
- Enrollments down
- Qualified teacher

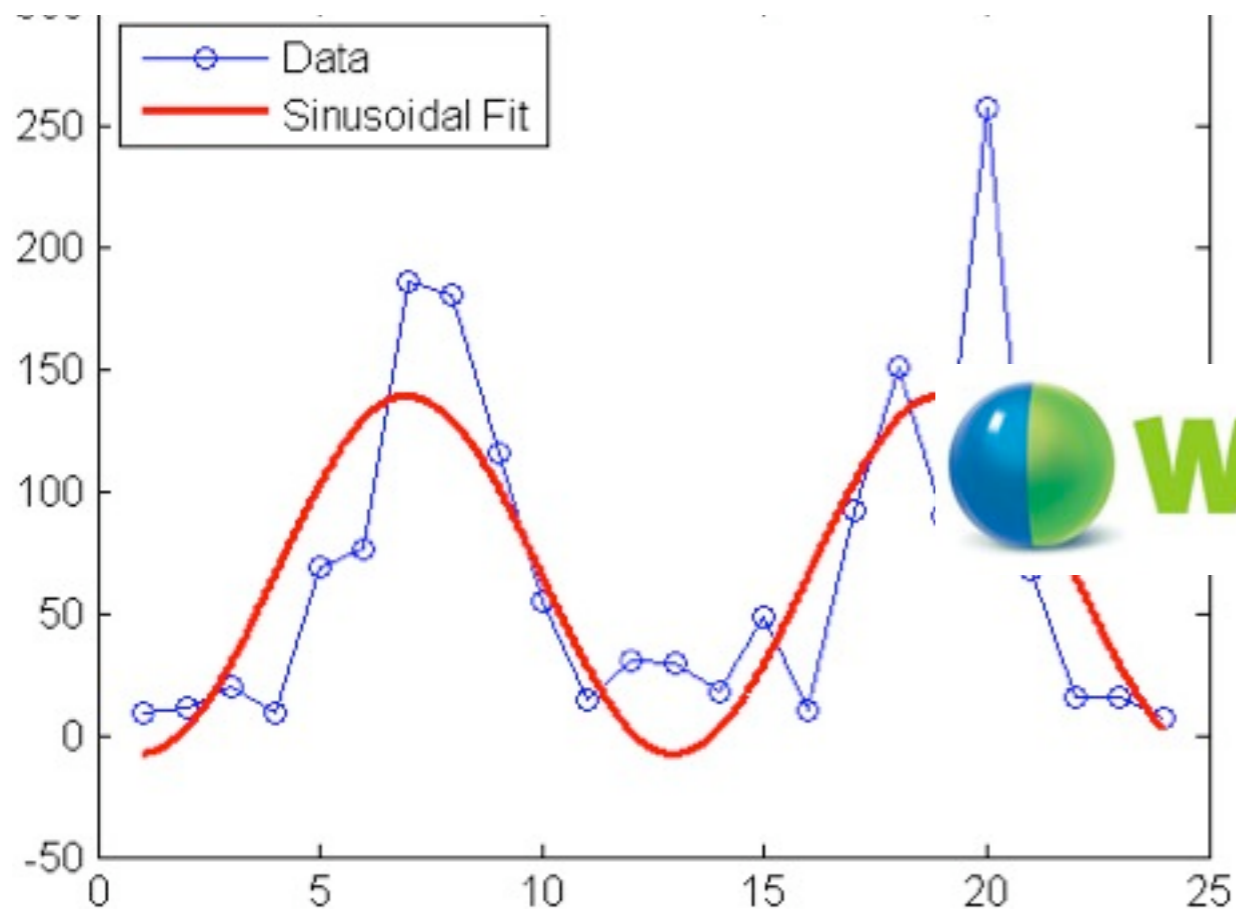


But across the state at another high school where enrollments have been dwindling, the math teacher is about to be reduced to an 80% schedule.



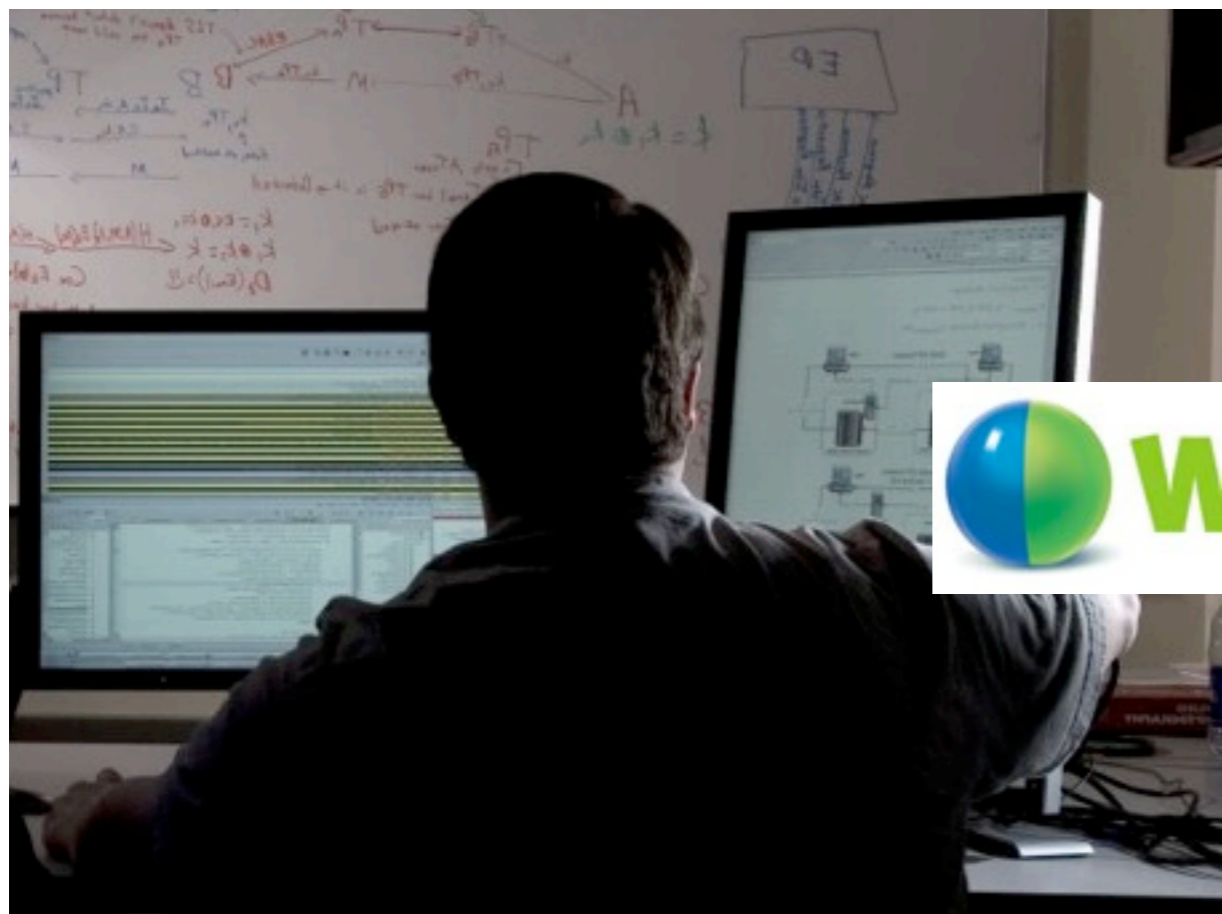
## The Solution

The Solution:  
To solve the problem, the principal of the first school arranged for the teacher at the second to conduct a calculus class three times a week using WebEx Meeting. The teacher stayed in his classroom; the students remained in theirs, 250 miles away.



## Real-time plotting

The remote teacher plotted a curve on his computer using the CalcPad software; the students saw it displayed immediately on the SmartBoard in their classroom, as they heard the teacher's voice (and saw his face) explain the nature of the function he had entered. Students walked up one by one to the WebEx-connected SmartBoard to plot new curves that extended the concept under study, as the teacher commented on their work (which he could see in real time on his computer, as he heard their voices.)



## Virtual office hours

On alternate days, the remote teacher held live office hours with his distant students, where students posed questions in text, as they showed their work on the whiteboard. This method allowed the teacher to work with several students' individual problems at once, and to share his comments as necessary with one or many.

# The Role of WebEx

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- Communications channels
- Text
- Diagrams
- Plots & Curves
- Equations
- Correction
- Q & A



## The Role of WebEx

WebEx in this situation serves as the channel for the students to communicate with their teacher at a distance, a channel which transmits just about all of the forms of interaction commonly found in a math classroom: presentation of information in text, diagrams, plots, curves, and equations by teacher or student; inspection and correction of student work by the teacher; question and answer sessions with the entire group or with individual students. WebEx provides an array of technologies that allow the course to carry on even though teacher and students are separated by a long distance.



# How they did it

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- License WebEx
- Select computer
- Connect to WebEx with browser
- Start teaching



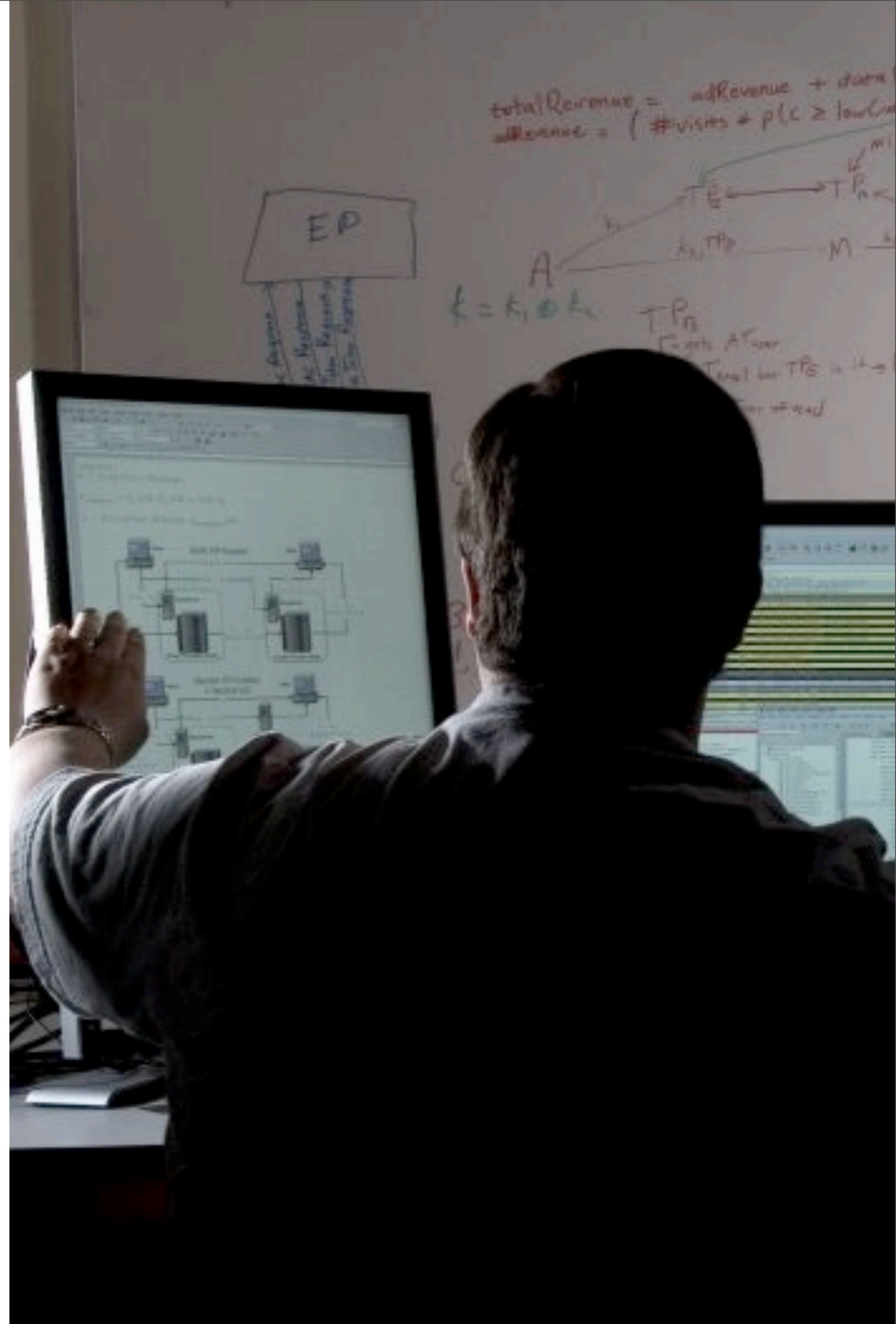
## How they did it

The school licensed WebEx, and selected a computer in the math classroom to serve as the school-based end of the communication. Because the computer came with a built-in video camera, microphone, and speaker, no hardware configuration was necessary -- and no software needed installation. They simply launched their web browser, connected to the WebEx server, and all was taken care of. Any software needed by WebEx was automatically provided through the online connection. This computer was already connected to the SmartBoard, so all was ready.

# Remote Teacher

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- Webcam
- Headphones
- Browser
- URL

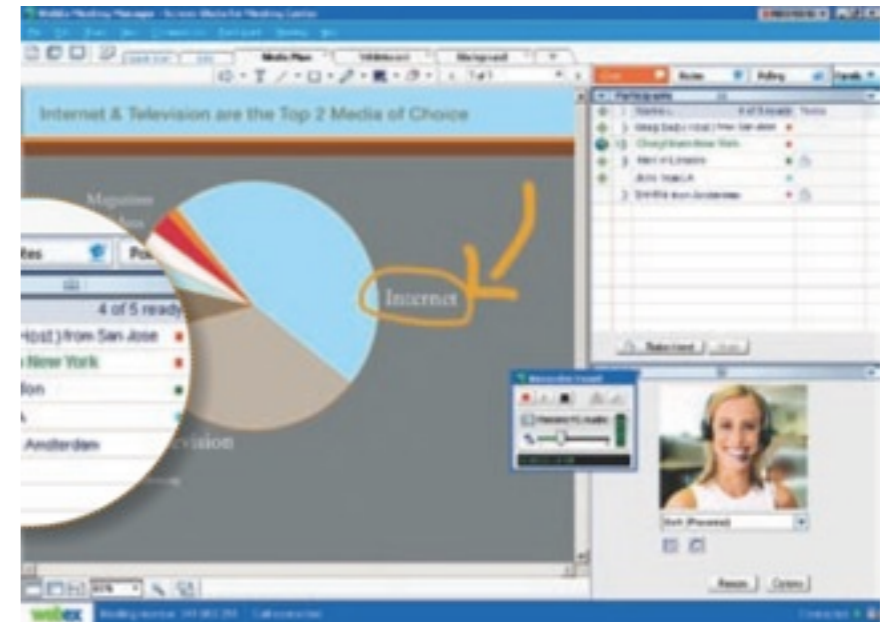


The remote teacher added a webcam and headphones to his laptop, fired up his browser. They were ready to communicate. The staff at the other school connected to the WebEx server, entered their password, and set up a regularly scheduled meeting every Monday, Wednesday, and Friday at 10:00. WebEx automatically emailed the time, URL, and password of the meeting to the remote teacher.

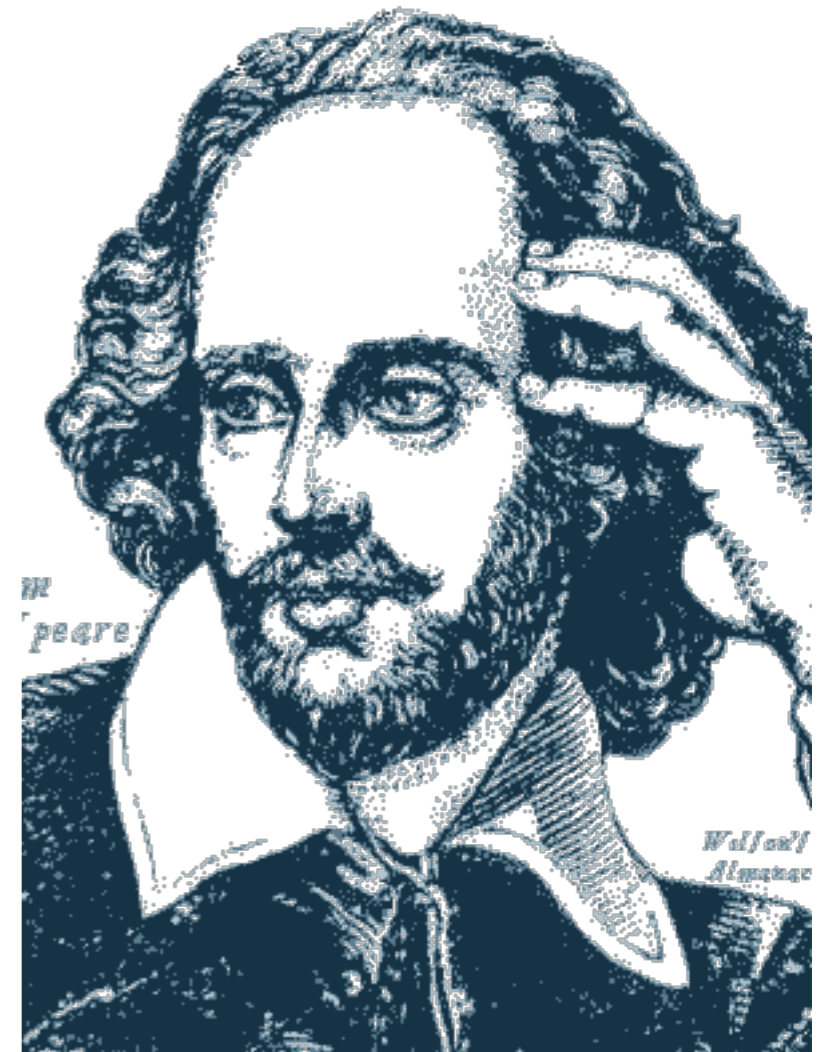
# Connect and learn

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- Connect to WebEx
- Present information
- Application sharing
- Pointer
- Voice contact



At the appointed hour, both the computer in the math classroom, and the one in the remote teacher's lap, connected to the WebEx meeting URL, entered the password, and joined the meeting. When the teacher wanted the students to see a plot on a graph, he clicked WebEx' presenter button, and told it to display his CalcPad window to the meeting. If the students didn't understand a certain point on the curve, they could move a pointer on their own computer as they asked their question. The remote teacher could see the pointer and respond accordingly. If he wanted to see the students' work, he clicked them into presenter mode and watched as their work appeared on his screen as they explained their results over the headphones.



Three more scenarios follow...

This presentation includes three more scenarios, in science, literature, and administration

# Borderless Butterflies

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*ButterflyUtopia.com*

The next example is from science research at the college level.

# Monarca Biosphere Reserve

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- Undergraduate Research
- Tlalpujahua, Mexico
- Butterfly Migration
- Digital Imaging



As the winner of her college's annual Undergraduate Research Award, a biology major was funded to travel in late August through early November to the Mariposa Monarca Biosphere Reserve in Tlalpujahua, Mexico, where she would measure the migrating butterfly population using a new digital imaging technique that she had invented.



## Automated estimation for accurate counting

Her method allows the automated estimation of the number of butterflies based on photos taken at periodic intervals in specific locations, whose pixels undergo image-analysis with her software algorithm. (Since they are monarch butterflies, the software counts the proportion of orange pixels in the photo to estimate the number of insects.) The result is a butterfly count that is twice as accurate as the human counters previously used in migration research.



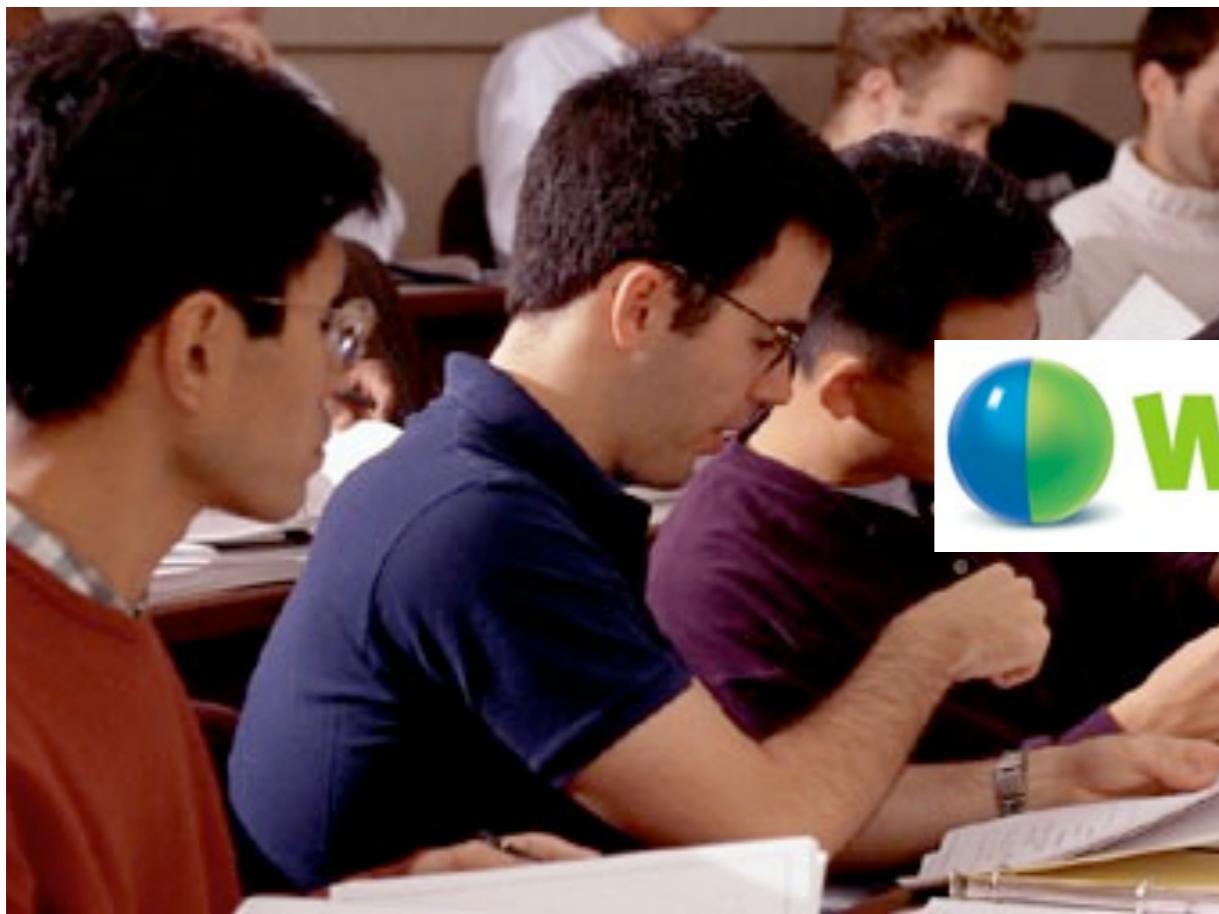
Math 499A  
Advanced Statistics Seminar



Required course  
Fall semester only

The trouble is, this student is required by her college to take the Advanced Statistics Seminar, Math 499A, in order to earn her degree in biology (and to qualify for graduate school). Math 499A, a seminar limited to 12 students, is taught only in the fall semester, when the butterflies are migrating and the student is scheduled to be in Mexico.





# The Solution

Laptops  
WebEx  
Seminar  
Internet Café

**What they did**  
The professor for the Advanced Statistics Seminar sets up his laptop at the end of the seminar table opposite his chair. He has set up a recurring meeting with WebEx every Tuesday from 2:00 until 5:00 PM, to coincide with his seminar. With the laptop open on the table, he can see across to the screen, as can the other students at the table. At 1:55 every Tuesday, he connects the browser to the WebEx meeting URL, and turns up the volume. The laptop, with built-in video camera, microphone, and speakers needs no further configuration.



## Video and voice Part of the seminar

As the rest of the seminar students wander in, they see their remote colleague's face appear on the display of the laptop, and hear her plaintive "Is anyone there?" voice. One of the students enlarges the image to fill the screen. Students lean over the video camera to greet her and ask how the research is going. At 2:05 the teacher gets the seminar started with a discussion of the sampling strategies that each student is using in his or her data collection. They respond around the table. The remote student chimes in at her turn, with voice and video.

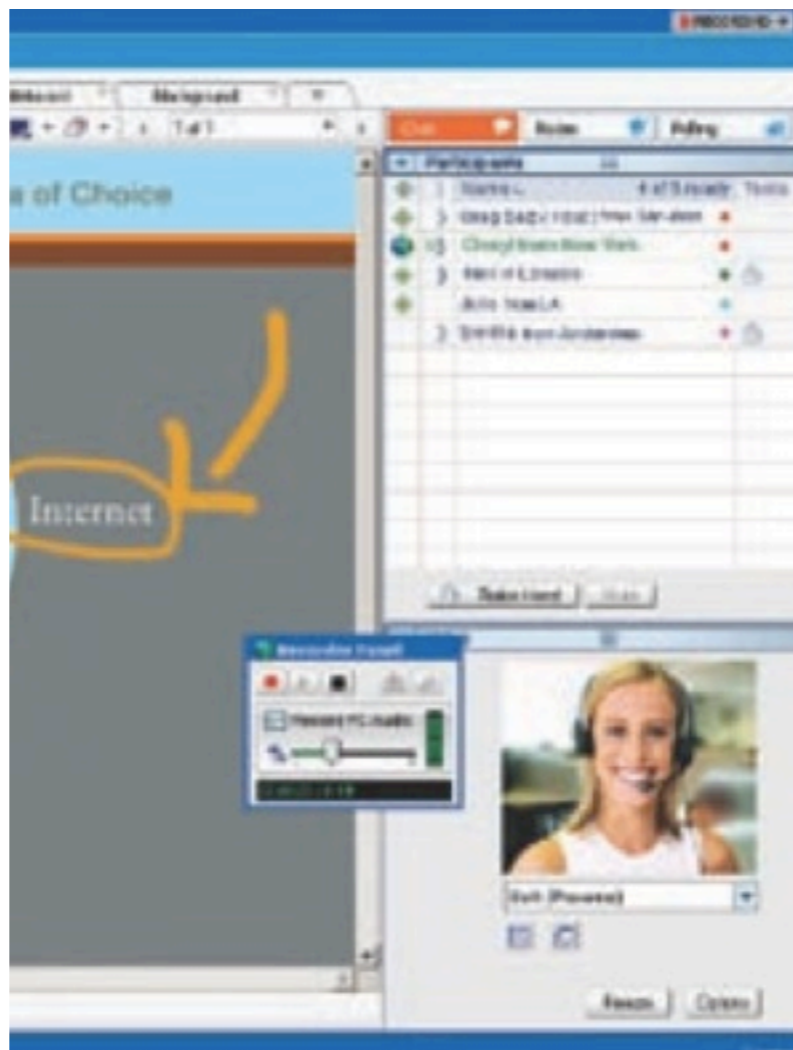
# WebEx

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- Text
- Photos
- Voice
- Video



The student in Mexico is sitting at the internet café in Tlalpujahuá, peering into the video camera in her laptop and making her report. The other customers are fascinated with what she's doing. She can display equations on the WebEx whiteboard, show sample photos to the rest of the class and zoom into the key details, pixel-by-pixel. It costs her the equivalent of US\$30 to spend the three seminar hours each week using the café's broadband connection, the only one in town. But it's worth it -- already what she's learned in the seminar about sampling error has helped her to modify her image-processing algorithm for more accuracy.



Full participation from remote location

WebEx makes it possible for this student to attend an important college course even though she's thousands of miles away. Except for touching the other students, there's nothing educational she can't do through her digital connection to the seminar. She sees all that's going on, she listens, she speaks, she shows her work, she asks and responds to questions. In the eyes and ears of her professor, she's a full participant in the course. His only accommodation to her special needs is to fire up his laptop once week and save a place for her at the seminar table.

# How they did it

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- License WebEx
- Inform faculty
- Initial support
- Self-supporting
- Many possibilities

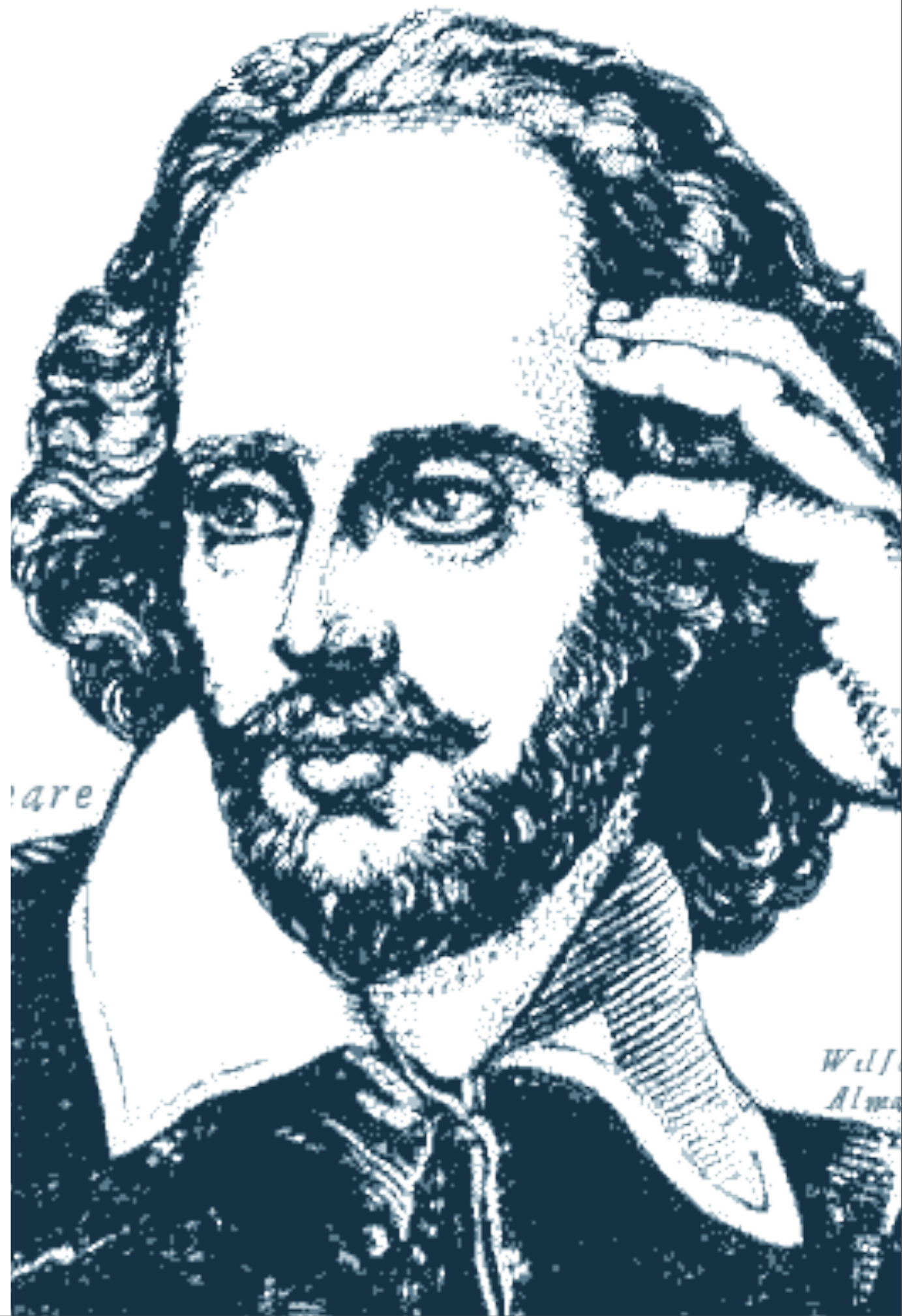


## How they did it

The College licensed WebEx, made the faculty, staff, and students aware of its possible uses, and provided technical support to get them started. Once shown how to schedule a meeting and set up his laptop, the professor was on his own each week to initiate the connection and bring the remote student into the seminar. The same was true at the student's end: she simply pointed her browser to the meeting URL, entered the password, and she was at the table. She learned from the WebEx web site how to do some of the more interesting applications, such as putting her images on the whiteboard, or displaying her equations to the class. Since these functions are built into WebEx, she needed no special configuration or engineering assistance.

# Expert Interview

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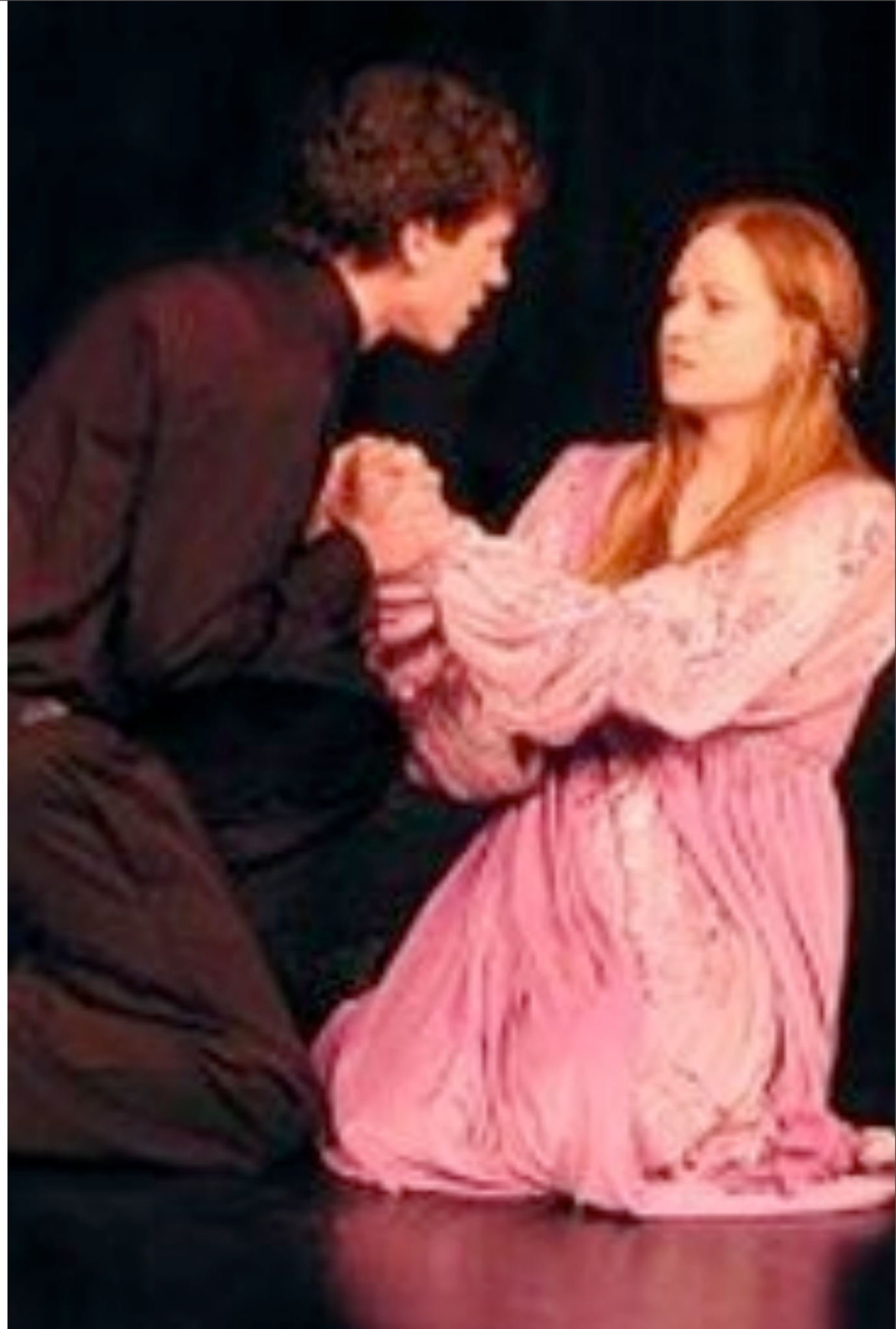


The next scenario comes from a high-school English class.

# Staging a Scene

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- Hamlet and Ophelia
- Key scene
- Who drives whom to madness?



A high school English class in California had developed what they and their teacher thought was a novel way to stage the scene in Shakespeare's *Hamlet* where the protagonist famously un-declared his love for Ophelia. It's a key scene in the play, and one which is normally staged to portray a helpless, innocent Ophelia and a rude wisecracking Hamlet on the verge of madness. Their version shows a cruel and complicit Ophelia toying with Hamlet and driving him to madness.

# Transcontinental Scholar

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- Folger Library
- Washington, DC
- See the scene



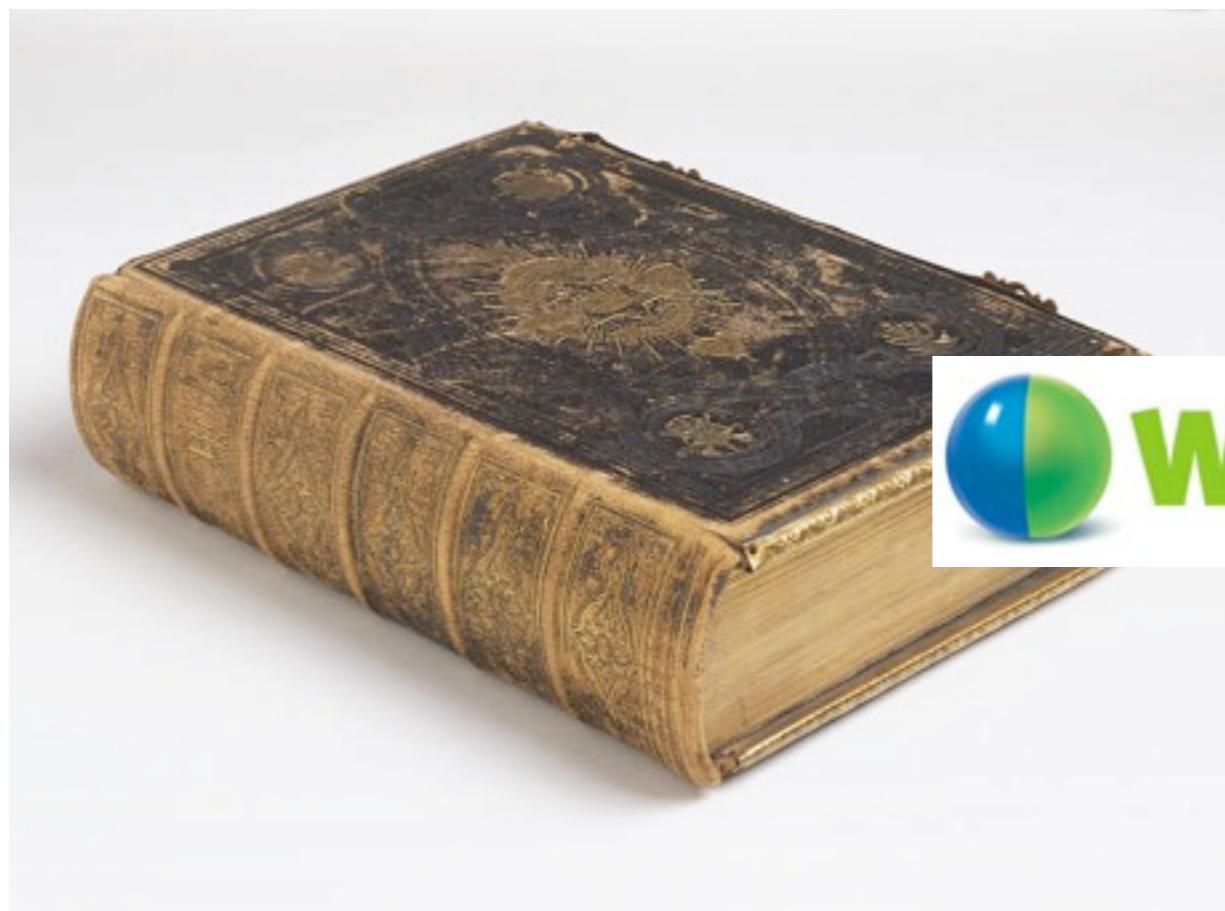
With the help of extensive online research, the students located the world's expert on *Hamlet*, who had recently published an authoritative exegesis of this very scene. He kindly agreed to correspond with the class by email to answer their questions. Intrigued by their ideas, this scholar-in-residence at the Folger Shakespeare Library in Washington, DC asked to see their scene so that he might analyze it further.





School stage  
Folger library

The cross-country analysis was accomplished through WebEx. A video camera and microphone focused on the school stage connected to a computer connected to a WebEx server. At the other end, the Shakespeare scholar and a few of his colleagues watched the scene unfold on the big screen in the Folger's conference room. When it was finished, he asked the students where they got their ideas. They explained how their staging had arisen from a discussion in class about gender stereotyping in literature. He asked them to wait a moment while he went into the rare book section of the archives, as they discussed the finer points of the scene with the other Folger scholars.



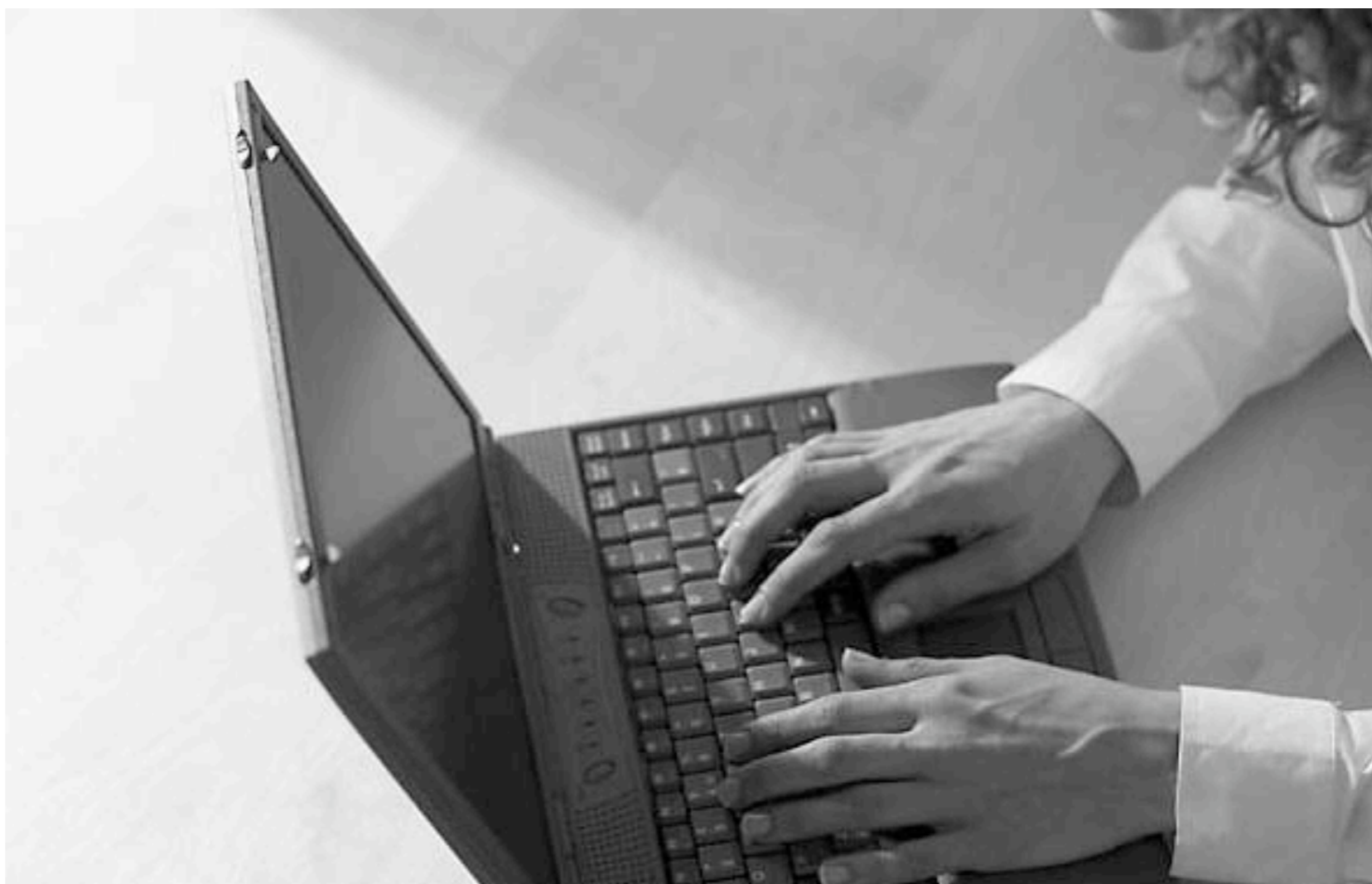
Document display  
Extended discussion

Onto the scanner at the Folger the scholar placed a page of scene directions and drawings from a 1735 document found in a London theater. As it displayed on the WebEx whiteboard to the students in California, they and their teacher savored the similarities to their own version. The online discussion continued for the rest of the afternoon.



Real-time multimedia communication  
Easy connections

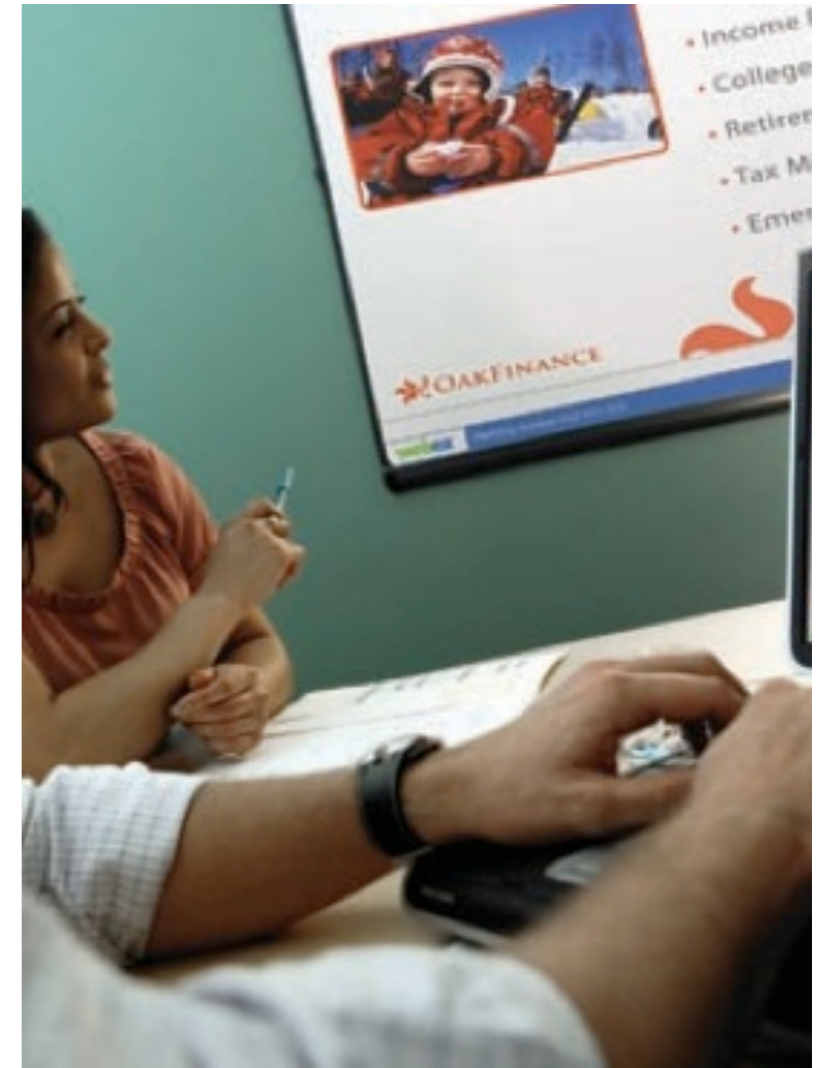
WebEx facilitated a scholarly exchange and a discovery that probably would not have occurred without easy real-time multimedia communication over long distances. WebEx allowed hard-working students in a rural school to work on an educational project with experts separated by a continent but united in their interest in Shakespeare's work. WebEx makes it easy for the outside expert to connect -- they simply point their browser to a URL and WebEx does the rest. So it's easy for the scholar or the speaker to sit at his or her desk and spend a few moments with some California students. And both sides can bring to bear whatever media they need to tell their story, from video to text to drawings to images.



License WebEx  
Inform faculty

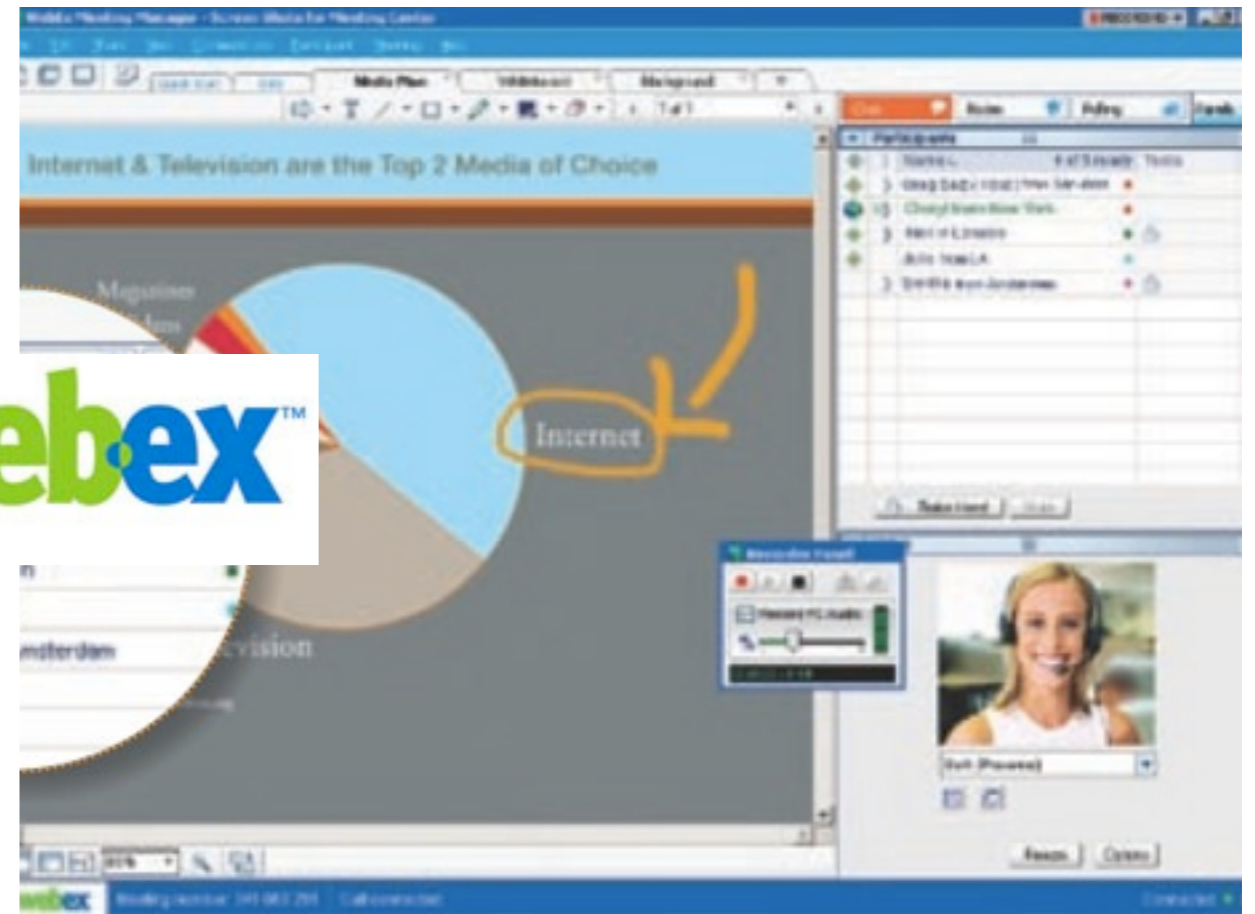
**How they did it**

After licensing WebEx, the leadership of the high school encouraged the faculty to reach out to resources and expertise that would enhance teaching and learning. Teachers and students learned how to use the internet to find out who the experts were, and then track them down, usually by email. Most of their contacts did not mind being used in this way, as long as the school made it easy for them and respected their time and schedule.



Schedule a WebEx meeting  
Configure computer

Once they found the expert they needed, they scheduled a WebEx meeting, and made sure the expert had what was necessary to connect. A squad of tech-savvy students contacted the expert in advance; he put them in touch with the technical people at the Folger Library and together they configured the necessary equipment for a two-way audio, video, and whiteboard session.



- Two groups
- See and hear
- Exchange documents
- Act out a scene
- Make comments
- Pose questions
- Text chat
- Archive

The session itself consisted of a conversation between two groups: students and their teacher at the California high school; and the Shakespeare scholar and his colleagues at the Folger Library. They could see and hear each other, exchange documents, and act out a scene from the play. In fact, as the scene progressed, the scholars at Folger used WebEx' text chat to comment silently on what they were seeing, and to pose questions to the students -- those not acting in the scene were monitoring the chat window. And the archive of the chat became an important document for further learning.

# Special Ed Staffing

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The last scenario of WebEx in education shows an online meeting in a school district.

# Mainstreaming

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- Hearing impaired
- Cochlear implants
- Prepare for mainstreaming
  - Specialist
  - Pediatrician
  - Teacher
  - Principal
  - Special Ed Coordinator



After six months with his new cochlear implants, a student was ready to learn for the first time in a regular classroom with a generalist teacher and non-hearing-impaired students. Getting everyone ready for this transition was no easy task. The student's specialist in Milwaukee, his pediatrician in Davenport, his teacher and principal at Rock Island, and the Special Education Coordinator at the central office, all had to work together to make his mainstreaming a success.





## How can we meet?

Arranging a meeting of all involved was next to impossible, and things were not progressing well until they started using WebEx. Now they are meeting once a week, just for a half-hour, but it has made quite a difference. For one of their meetings, they have added an acoustic architect from Chicago to the group. After the student's first visit to his new classroom, everyone noticed how noisy it was, and even with the implants he was not hearing as well as he did at home or in the doctor's office.



Video tour  
Virtual visit

The architect asked his teacher to take him first on a video tour of the room. At the architect's direction, she pointed and zoomed the video camera at the windows, the ceiling, the floor, the doors, the desks, the chairs. All this video was being saved in an archive by WebEx so that the architect could examine it more closely later. Next the architect asked everyone else in the meeting except the teacher to switch off their microphones so he could concentrate on the acoustic environment of the classroom. This meeting was specifically scheduled during the school day so as to capture a typical noise level.

# Noisy Classroom

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- Fan
- Hard surfaces
- Intercom
- Chalk
- Hallway



It was clear to everyone why the student was having trouble hearing. The classroom was alive with extraneous noise. A rattling ventilation fan, metal chair legs scraping on an asphalt tile floor, buzzers and announcements from the intercom, other classes talking as they moved through the hall, squealing chalk, all reflected and amplified by the hard floor, cement walls, glass windows, and smooth metal ceiling.



## Group decision-making

In the discussion that followed when all had switch their microphones back on, the recommendations were clearly understood by the teacher (who would implement some of them), the principal (who would coordinate the necessary modifications to the room), the custodian (who was brought into the meeting by the principal as soon as she saw where things were heading), the special ed coordinator (who would budget for the necessary expense), and the specialist (who was pleased to have the problem identified.) It was a short list: in the short term, put tennis balls on all the chair and table legs while waiting for the carpet to be installed during vacation week; put insulation around the door to the hall; install sound-absorbing panels on the walls and ceiling; replace the ventilation fan; switch from chalkboard to whiteboard; put drapes over the windows; and route the intercom through a small speaker on the teacher's desk.

# Joint Staffing

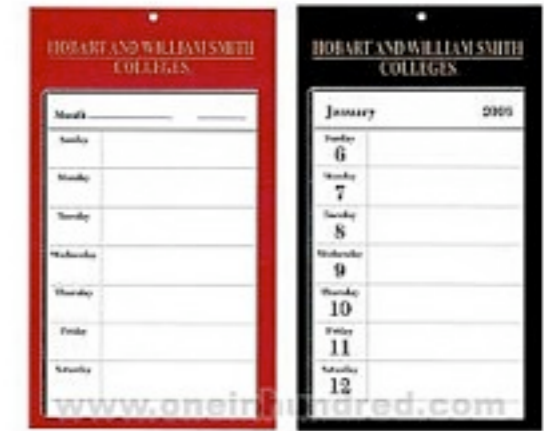
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- Audio
- Video
- Voice
- Image



## The role of WebEx

WebEx enabled what is called a *staffing* on this student -- a meeting of group of people involved in his care and education, designed to help him overcome his handicaps. Without WebEx, a staffing such as the one described above would have been almost impossible to arrange. WebEx made it possible to bring to bear a range of expertise from many different locations to focus on a single problem in real time. And enabled many foci: video, audio, images, background sounds, voices. It allowed a specialist many hundreds of miles away to make a virtual visit to the student's classroom in the company of other specialists. And for all of them to confer to solve the problem.



Staffing = WebEx + Calendar + Camera + People



#### How they did it

The school district licensed WebEx, and briefed administrators on its possibilities. The Special Education coordinator quickly recognized its ability to help conduct the all-important staffings required by state and federal law. He scheduled the meetings on the WebEx calendar, which sent out automatic reminders to the participants. He suggested the teacher connect the school's good video camera to the computer to give a better-quality image for the architect's analysis, and better audio.

He found that it was easy for the outside experts to connect, and that the meetings went faster online than they did in person. No one traveled, all worked from their classrooms or offices where they necessary resources stood close at hand.



Four scenarios of Webex in education

<http://www.webex.com/enterprise/educational-web-conferencing.html>



You have seen four scenarios of how WebEx might be used in education. I am sure you can imagine a similar application of this technology in your own school. For more information, connect to <http://www.webex.com/enterprise/educational-web-conferencing.html>