Typical format for blended-learning courses

Our approach to combining

online and offline components

students prepare for class by doing a variety of activities on line

preparing presentations

Class preparation

Class meetings students meet face-to-face (off line) with an instructor in

Class preparation

a "bricks-and-mortar" setting Class meetings students prepare for class off line students meet face-to-face on line with students from other institutions using a web conferencing platform



guest speaker via online web conferencing

Using Online Video Conferencing and File Sharing to Run Multi-Institutional Seminars and to Bring Guest Speakers to the Classroom



Barbara J. Tewksbury¹, John P. Hogan², & Charlotte J. Mehrtens³

¹Hamilton College, ²Missouri University of Science and Technology, & ³University of Vermont

Multi-institutional seminars

Overview

- The Desert Eyes Project is an NSF-funded research project investigating the origin of enigmatic structures in sedimentary bedrock of the Western Desert of Egypt. The project is a multi-institutional project that has involved four colleges and universities in the US and five universities in Egypt.
- We developed a weekly seminar course in order to prepare the faculty and students (both graduate and undergraduate) for a month of field work in Egypt.
- We posted reading, mapping, and presentation assignments in DropBox that faculty and students completed on their own between seminar meetings.
- We met weekly as a group for a virtual face-to-face seminar during which we had short faculty and student presentations, discussions, and work sessions. We used online video conferencing services that allowed us to both hear and see one another on screen. For work sessions during the seminar, students used their own Skype accounts so that students from different institutions could pair up and work together on discussion and mapping assignments.
- We recorded all sessions and posted them to DropBox for our Egyptian colleagues to access for their own seminars.
- One of us (Tewksbury) has also used online video conferencing platforms to have guest speakers talk to a class in real time and to allow students to interact with and ask questions of the speaker. She has also given vitual talks both in the US and in Iraq.

Pre-class preparation - off line

- Reading in the literature and preparation for discussion
- Preparation of individual presentations, mini-presentations, summary papers, etc. Image analysis, mapping, and other individual or team assignments
- Meetings to work with team members, either at own institution or via Skype for

multi-institution teams **Group preparation**

seminar sessions

- If the seminar meets once per week, we have found it useful to have local team meetings and deadlines midway between seminar sessions to check on progress, answer
- questions, and make sure that participants are making adequate progress between

"Face-to-face" class session - on line

Overall set-up



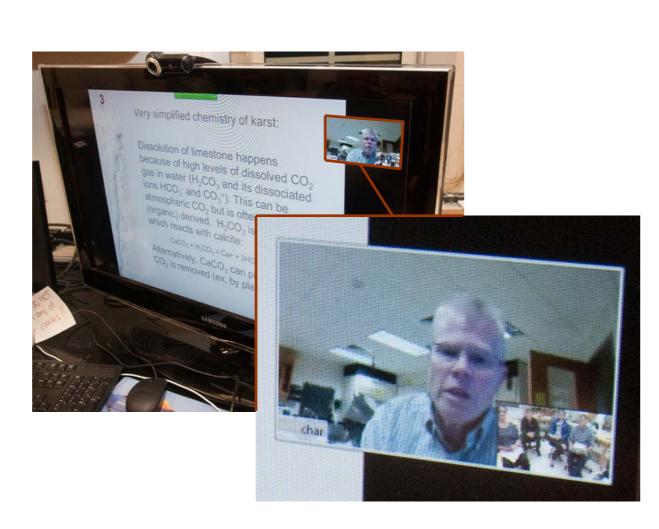
- The overall set-up involves a web conferencing platform, plus a webcam, microphone, and speakers
- at each site (see bottom panel for advice on choices). Because we have only a few people in our seminar. we use a large flat-screen monitor for projection. A larger group could use a data projector and a large standard projection screen.

Opportunities and benefits

- For collaborative research: A weekly/biweekly seminar keeps a project rolling, and everyone has deadlines to keep them working. The seminar also keeps all of us thinking and discussing on a frequent basis and involves all of our students in
- For seminars in specialized topics: This is an outstanding mechanism for offering a specialized seminar that either takes advantage of expertise from elsewhere or uses multiple institutions to provide a critical mass of students.
- Prep for multi-institutional field work: A virtual seminar is a great way for people to get to know one another before going into the field and to develop a common background and sense of purpose. We will be running a multi-institutional seminar in spring 2015 in advance of a summer field study in Iceland.

Presentations





- It's very easy to have discussions and commentary during presentations because everyone can hear all of the participants at all times.
- The images at right show what happens when one of the participants asked a question of the speaker above. When he began talking, the web
- conferencing software switched the small window to a view from his web cam, and everyone could see him speaking and gesturing as he made his

How "real" does it feel?

- At one recent seminar, Hogan (at MS&T) offered that he wished he had a mask. The first thing that zinged through Tewksbury's head was, "Oh - hang on a sec. I have a puffin mask in my lab! Oh wait. I have no way to give it to you." It truly felt like he was right in the room.
- and runs a PowerPoint presentation the same way as if everyone
- We've found, at least in Webex, it's better to use Desktop Sharing. In Webex, none of the animations are active in PowerPoint in application-sharing mode, and it is a complicated 4-step process to

switch from one application to another (e.g., from PowerPoint to

- Google Earth and back again). Our experience is that the audio of web conferencing platforms is typically more robust than the video, and one or more sites may be able to hear the audio but not be able to see the video. We also always make sure that all sites have copies of the PowerPoint presentation that can be run locally if screen sharing freezes.
- Most web conferencing platforms allow easy switching among presenters.
- The view at left shows a PowerPoint presentation being delivered by someone at a different site.
- We not only see her PowerPoint presentation but also a small live view of the speaker giving her presentation. This allows us to see gestures that accompany the

Discussions



• When not screen sharing, all monitors show windows with the participants in real-time video. At left, you will see the Hamilton group set-up, with participants at the four other sites shown on the screen in the Webex conferencing platform. Three of the sites are minimized at

the bottom of the screen, and the person speaking (in Alabama) is

maximized. At right, you will see the view of the Hamilton group on the

- screen at the site in Missouri. Other web conferencing platforms (Skype, for example) show all participants in same-size windows (see left-hand picture at the very top
- Discussions are easy and very natural in this web conferencing environment, and everyone can see each other's expressions and

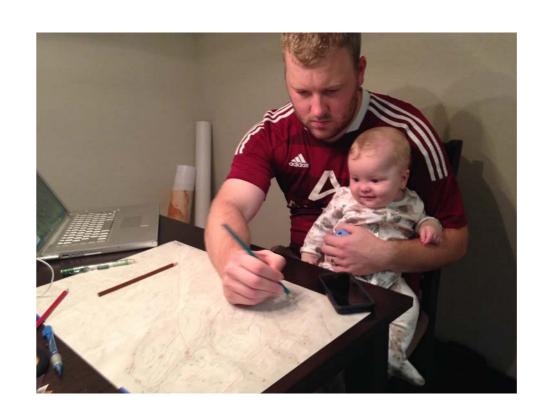


Interactive sessions



- We commonly also have interactive sessions during our seminars, where people work on their own laptops and one person in the seminar shares a screen to direct the sessions.
- In the example above, everyone has Google Earth up with a set of placemarks, and each person can view the areas, zoom in and out, make their own observations, and contribute ideas to the discussion while still being able to have everyone see the same view on the big screen.

Synchronous work sessions



- We also commonly conduct synchronous work sessions during seminar time, with team members from different sites working together. Individuals use their personal Skype accounts to talk with each other over Skype during the seminar session. • Synchronous work sessions commonly involve comparison of mapping and analyses or discussion of a particular topic.
- When the group gets back together again during the seminar, each team reports back on what they have done.
- Having people from different institutions working together in pairs promotes cross-fertilization of ideas as well as helps people get to

The importance of testing & back-up plans

We cannot emphasize enough that both all-up testing in advance and back-up plans are critical.

- Do a test session to make sure that everyone knows how to sign in and use the conferencing platform you've chosen.
- Test all aspects of the system at all sites. Check especially for audio feedback issues (bottom panel), and re-test if anyone makes hardware changes. Make notes on the computer audio and video settings and cable configurations so that you can easily get back to the right configuration if someone messes with the computer before your
- Check the quality of the environment as well. Is lighting adequate? Can everyone be
- seen in the webcam views?
- Be sure to test at the same time of day as you will run your session bandwidth might be great at some times of the day and poor at others. In the evenings, you will likely be competing with people using the Internet for Skype, Netflix, etc. During the day, you may benefit from or be hindered by how each institution has set priorities for "bandwidth shaping" (i.e., how the institution allocates bandwidth).
- On the day of the session, have people sign in about 15 minutes early so that you'll have time to fix any issues. Be sure to have cell phone numbers for each site so that you can trouble-shoot easily of the audio fails to connect.
- Have back-up plans ready. Video freezes more commonly than audio. If everyone has a copy of a PowerPoint to be presented, for example, someone can watch the PowerPoint locally while listening to the audio and contributing to discussion on line.
- If you have a participant on a low-bandwidth connection (especially someone in another country), both audio and video may be spotty. Be prepared to record the session so that the person can listen later.

Using video-conferencing to bring guest speakers to class

Why use video-conferencing for guest speakers?

- Gives students a chance to interact with professionals that they would otherwise have little chance to meet.
- Takes much less time on the part of the speaker. Many busy/famous people are more than happy to give an hour-long talk if they don't have to travel.
- Costs a lot less. There are no travel and per diem costs for a virtual talk, and many people are willing to speak for free or speak for a smaller honorarium if they don't also have to travel.

Classroom set-up



• Data projector and computer: a computer running a web conferencing platform (Webex in this case) is projected through the classroom data projector.

respond to a question.

- Wide-angle web cam: the speaker can see the entire class on her own computer screen during the presentation if a wide-angle webcam is set at the front of the room. She can easily see a raised student hand to
- Amplified speakers: built-in computer speakers are not loud enough for this kind of presentation audio. We have ceiling speakers, but any type of external speaker works
- Noise-cancelling microphone: to prevent audio feedback (see description at right), we use a noise-cancelling microphone set in the middle of the students so that they can ask questions of the speaker.

Making it work

Best general advice: don't reinvent the wheel

Talk with your campus IT people to see what is already available and what they support. Ask for help setting up your system. Talk with other faculty who have done this successfully.

Choice of web

Connectivity has been good enough this fall that we have had an Egyptian student join us seamlessly from Alexandria, Egypt

(at 1:00 a.m. his time!).

Skype/Google Hangouts

conferencing platform

Our experience: we have run two full semesters of seminars where people connected via Skype.

• These services are free (Skype now has free group chat). Skype and Google Hangouts can handle multipoint sessions (25 for Skype and 10 for Google Hangouts). Screensharing is possible.

- At the time we ran these seminars (2011 and 2012), we had serious connectivity issues. We had many seminars where the audio from one site was fine but the video was frozen for the entire seminar. Bringing in participants from Egypt was not possible at all.
- The problem was particularly severe in the evenings when lots of students were on line and downloading Netflix, etc. Our ITS assigned us some dedicated bandwidth, but that didn't solve the bandwidth issues beyond Hamilton.

Webex/AdobeConnect/GotoMeeting/BlackboardCollaborate

Our experience: we are currently running a seminar with four sites using Webex, and one of us (Tewksbury) has used AdobeConnect, GotoMeeting, and BlackboardCollaborate for guest speakers and one-off web seminars.

- Quality much better connectivity we have had no issues of video freeze or audio cut-outs. This is huge for us the frustrations of previous seminars is completely gone.
- It is very easy to share desktops or show Powerpoints and to transfer the presenter role to a person at a different site to share his/her screen.

Cons:

- These services are not free. Hamilton is in a 6-institution consortium that currently provides Webex for interested • With Webex, there is no way to have all sites appear on the screen as windows of the same size. The site with the
- biggest window is the site where the person is currently talking. During discussion, the big window changes from one speaker to the next. Non-speakers are minimized.

Presentation

 The speaker shares her computer screen and delivers the talk from her computer, controlling the presentation as she would if she were in the room.

Students see the presentation in the largest

the ceiling speakers in the room. • Students see the speaker live in the window at upper right. The tiny window at the arrow

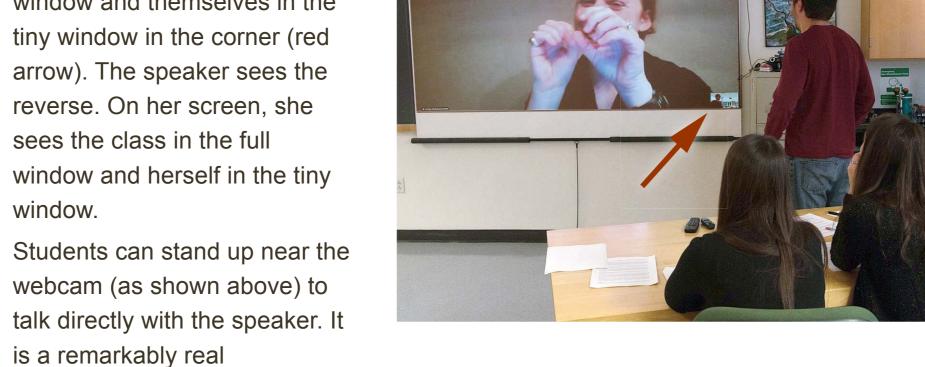
shows the view from the classroom webcam.

window and hear the speakers voice through

 The speaker's window shows the same PowerPoint presentation, but the smaller window is reversed. She sees herself in a tiny window and the class in a larger window, enabling her to see and respond to student

questions during the talk.





Discussion · After the talk, the speaker

stops screen sharing, and the students see her in the full window and themselves in the tiny window in the corner (red arrow). The speaker sees the reverse. On her screen, she sees the class in the full window and herself in the tiny

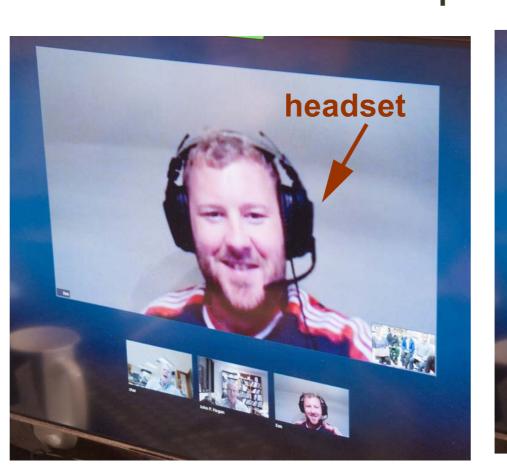
experience.



Audio

Problem: the speaker's voice echoes back because the microphones on the receiving computers hear the voice

broadcast through the computer speakers and then re-broadcast the audio back to the other computers. Solution: isolate the audio output and input at each place





If you have only one person at a particular site, a headset or earbuds connected to the computer allows the person to hear the audio but prevents the computer microphone from picking up and re-broadcasting the audio from other sites. The computer microphone is used as the audio input from the individual sites.



If you have a group of people at one site, everyone needs to be able to both talk and listen. Use a high-quality noise-canceling microphone to capture the voices of the participants. In the set-up shown above, participants hear the sound through ceiling speakers, but the microphone on the table picks up only the voices of the participants and not the ambient noise/voices from the speakers.

Video

A computer with a standard built-in web cam works fine for one or two people at a site. For a larger group, an inexpensive wide angle webcam (such as at right) allows the entire group to be seen at the other sites.





Recording Many options exist for recording entire

sessions, including programs such as Camtasia. We have gone a simpler route and used an audio recorder app on an iPad and posted both ppt slides and the audio to DropBox. Remember to obtain permission from speakers before recording.

iPad with RecorderHD



