

Experience with Teaching an Online Pathology Course (Lectures, Labs, Discussions)

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Summary:

The author describes his 1) **background**, 2) **technology**, 3) **experience**, and 4) **joys** in delivering an entire Pathology course in 2009-2010.

Background:

The early days of the Internet were characterized by information (search engines) and simple person-to-person communication (e-mail), but now has evolved into interactive television, which includes spam, scammers, viruses, and spyware. There are a host of methods for people to share voice and graphics simultaneously, most of which work perfectly well on a one-on-one basis, but fall short beyond that. My dream had been to broadcast pathology lectures, pathology microscopic slides, and to host discussions all over the world using standard free software and standard home internet connections. That dream was realized in the fall of 2009. I was asked by Dr. Dan Harrington of Destiny University Medical School in St. Lucia to teach a pathology course geared for USMLE, step one.

Technology:

I had a good familiarity with all of the chat and instant messenger programs, especially those with multi-user capability. In addition, I had experimented with some of the "share screen" programs which seemed to work well for two people only. I had a basic familiarity with the popular net conferencing software such as WebEx[®], but what I became particularly intrigued by was a newer free website called Dimdim¹, which Dan had been using.

Of course all of the net meeting software programs promise you the moon, especially if you pay for the premium services, but they usually fall short because of bandwidth hogging, if you are a mere mortal with a standard home DSL or cable account. Jim Austin at Destiny was the mastermind of working out all of these false promises and turning my classes into seemingly unlimited international online presentations. What I am the most proud of, and this may be unique to pathology, is that I discovered a way to put all of my pathology slides under the virtual microscope and project for each individual student simultaneously and easily. This is akin to every student feeling he is being personally tutored by sitting down with the pathologist over his office microscope.

The general technique, specifically, is this: the student with the greatest bandwidth hosts the audio portion of the lecture and lab sessions by virtue of using the Skype^{®2} software, and the pathologist professor controls the video portion (Dimdim). This method enables a large

number of students, perhaps at least 10 or 20 or more, to enter a pathology classroom and lab as long as the following conditions are satisfied:

Each student:

- 1) is familiar with Skype.
- 2) has a broadband hard wired Internet connection, not WiFi.
- 3) mutes his microphone except when he is speaking.
- 4) uses the Microsoft® or Firefox® browser, not Chrome®.
- 5) must give his Skype address to the student who is hosting the audio BEFORE the session starts.

The professor:

- 1) must know how to use Skype.
- 2) must be a free registered user of Dimdim, have an account, and know how to host a meeting.
- 3) must go to the "preferences → features tab" after signing into a session, and change the default first three audio visual options to

"none", "off", and "off", BEFORE the session starts. (see below):

The screenshot shows the 'Update Preferences' dialog box for Dimdim. The 'Features' tab is selected. In the 'A/V & Chat' section, 'Audio/Video' is set to 'None', 'Auto Microphone' is 'OFF', and 'Auto HandsFree' is 'OFF'. In the 'SynchroLive Resources' section, 'Computer Screen' is 'ON', 'Whiteboard' is 'ON', 'Web Pages' is 'ON', 'Documents' is 'ON', 'Participant List' is 'ON', 'Participants' is set to 15, and 'Recording' is 'ON'. The 'Meeting Length' is set to 2 Hours and 15 Minutes. In the 'Advanced' section, 'Meeting Assistant' is 'ON', 'Lobby' is 'OFF', 'Network' is 'Cable/DSL', 'Attendee Invite' is 'ON', 'Return URL' is 'http://www.dimdim.com/tha', 'Feedback Email' is 'minarcik@gmail.com', 'Send Invites using' is 'Dimdim', and 'Custom Button' is 'http://null' with a 'Label' of 'null'. 'Save' and 'Cancel' buttons are at the bottom right.

- 4) must select the orange "computer screen" option when starting the session.
- 5) must click on the "room name" link, which puts the URL of the session into the copy-and-paste buffer, so he can then "paste" that information into the chat box of Skype, for all the students to see and click on, which will then enable them to automatically enter the classroom, after entering their name. (None of the student participants need to know anything about the technology of Dimdim).

After the professor has successfully established a Dimdim session, and all of the students have entered the classroom, as long as he has selected the "computer screen" option, at that point, anything which is displayed on his screen will be seen by all of his student attendees. He can show his power point presentation in any way he prefers, and he can display his pathology slides as well. We have experimented a lot with online viewers, with not much success, but if the pathologist zooms in on huge FPX³ image files, obtained free from the University of Iowa, and displays these files with the offline LivePix 2.0 Deluxe[®] viewer, also obtained free, he can then display and zoom in on his pathology slides and each student will feel he is peeping into the pathologist's microscope while the pathologist is explaining the slides and pointing things out.

All of these steps are summarized in a cookbook fashion in table 1.

Table 1: Ten Cookbook Steps

1) Make sure you have a relatively recent (3-4 years) old desktop or laptop PC or less, hardwired to a DSL or cable broadband internet connection. WiFi may not work. FIOS would be a dream! Macs have worked as an attendee computer, and they have worked as a host computer also.

2) Make sure you use the MSIE (Explorer) browser. Firefox will work, Chrome will not work. Safari has worked.

3) Download the latest version of Skype (currently 4.1), and learn how to use it. Have one of your of your student attendees CALL the entire group, including you, preferably the student with the fastest internet connection. It is important that the Skype initiator be DIFFERENT from the Dimdim presenter, for bandwidth preservation purposes. Having a DIRECT microphone input for the presenter, rather than an open mike, might improve quality, and having the student attendees DISCONNECT their mikes (TOTAL disconnect, switch off or pink plug unplugged) while not talking IS NECESSARY! Of course they can switch ON to talk anytime. If you do not feel comfortable using Skype, this project will fail.

4) Go to www.dimdim.com and register for their FREE service option, and then click the button to HOST a meeting.

5) Make sure in Dimdim, under "Preferences", that you set the audiovisual option to "NONE" under the "Features" tab in Preferences, and switch off the "Auto Microphone" and "Auto HandsFree" options also, then "SAVE" these options. These three items are the only differences you will need from the default settings. Failure to do this will have catastrophic results.

6) When the Dimdim meeting starts, it will prompt you to select one of these options:

a) "COMPUTER SCREEN" [ORANGE]

b) "SHARE WHITEBOARD" [GREEN]

c) "SHARE A PRESENTATION" [BLUE]

Select the "COMPUTER SCREEN" [ORANGE] option.

7) Then, when you are finally in the classroom by yourself, you will see your Dimdim user name on the top of the Dimdim window (which is your "ROOM NAME"). If you click on this "Room Name" it will automatically "copy" the URL of the meeting into your clipboard.

8) "Paste" this URL into your multiuser Skype 4.1 window for all your attendees or students to see, whom you have already been talking to (voice) freely, so they can all click on this link and enter the meeting room in a few seconds. They should best be using the MSIE browser also, and Firefox might be OK too, but Chrome will currently fail.

9) Once they are all in the room, start your class, remembering that EVERYTHING you now see on your computer screen, they will also see, e.g., powerpoints, web pages, OFFline virtual microscopy viewers (online java viewers, like the one at the University of Iowa, may work, but it will probably not allow the presenter to navigate the microscope for the students, and they will have to do it by themselves). There is a way of fixing this, but it is horribly complex. OFFLINE viewers however, such as "Live Pix Deluxe" displaying FPX files, WILL work fine! All students will hear you and each other perfectly clearly.

10) So far, I have tried this technique dozens of times and hosted classes on 4 different continents simultaneously (not South America, Australia, or Antarctica), with up to 10 separate student attendees. IT WORKS ALL THE TIME, as long as all participants are using the latest Skype (4.1 is best), the latest MSIE, and a hardwire connection to a DSL or cable internet connection, NOT WiFi. Macs have worked as attendees and hosts. WiFi connections might be unstable. I can EASILY increase my class size to 20. Not a single student, so far, has had a technical problem, after we laid down the ground rules!

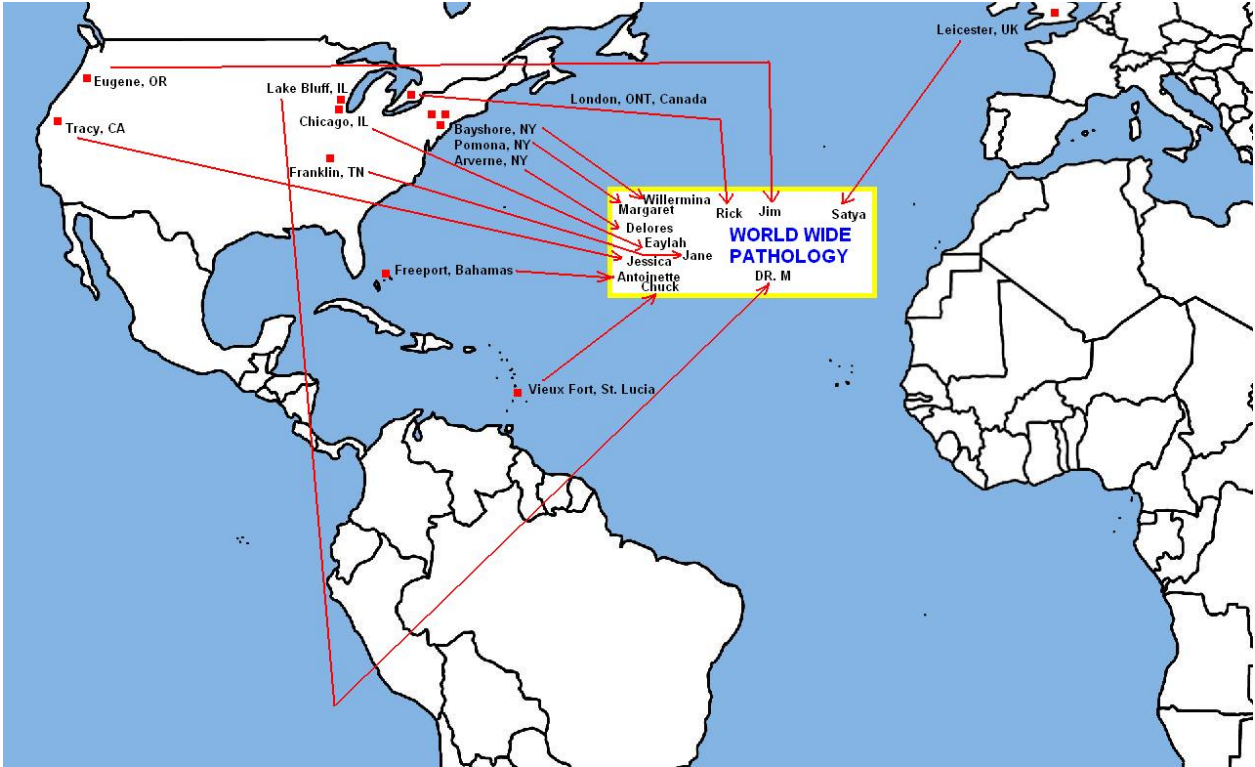
Experience:

This technique has worked amazingly well, although in the first couple of sessions we were all getting adjusted. But now the kinks have been ironed out, we enjoy every class with the great joy and ease and confidence, with no fear of technical sabotage. All of the students very strongly prefer the virtual pathology classroom and laboratory to the real classroom and the labs. Table 2 shows the obvious advantages of online over real classrooms and labs, but the reality of the experience is that:

- 1) All students can hear the professor just as clearly as though they were sitting right next to him in front of his computer and microscope.
- 2) All students can hear each other well.
- 3) The professor can hear all of his students with crystal clarity also.
- 4) Every student can see the tiniest detail on every PowerPoint®.
- 5) Every student can Google®, Wiki®, or chat with colleagues during the presentation without disturbing others, either as a group, or one on one.
- 6) Every student feels personally tutored as though he was sitting with the pathologist one-on-one, at his microscope.

TABLE 2	VIRTUAL	"real"
Can the students choose the most convenient and comfortable location for their class?	YES	no
Can all the students clearly hear and speak to the professor, and each other?	ALWAYS	rarely
Can the professor stay focused on the powerpoint slides, and not have to continuously alternate his eyes between the class and the screen?	YES	no
Can the students privately chat with each other during the presentation session?	YES	no
Can the students eat and drink?	YES	no
Can the students quickly google unfamiliar terms during class?	YES	no
Can the students be in pajamas, naked, or in bed?	YES	no
Are sessions remarkably easy to record (push one button) for online archiving for the benefit of absentee students?	YES	no
Can the students avoid commuting, wasting fuel in traffic jams, getting traffic tickets, and being ripped off on parking?	YES	no
Can all students see even the smallest powerpoint text clearly?	YES	rarely
Is the microscopic lab slide material able to be projected to all students conveniently?	YES	sometimes
Can students be with each other personally during class?	if they choose	YES
Is this method extremely cost effective?	YES	no
Can the professor be in total charge of his course rather than a school employee?	YES	no

My students came from three different continents (see below)



and all filled out a simple questionnaire to report their experiences as well (see below)

- 1) Have you had any significant problems hearing the Audio? Y/N
- 2) Have you had any significant problems seeing the powerpoints or microscopic slide projections? Y/N
- 3) Can you think of any aspect of pathology which needs to be taught in person rather than online? Y/N

Eaylah: NNN
Rick: NNN
Chuck: NNN
Antoinette: NNN
Jane: NNN
Jessica: N*NN
Margaret: NNN
Satya: N*N*N
Wilermina: NNN
Delores: NNN

(N*NN means “temporary” problems with audio only, but resolved)

(N*N*N means “temporary” problems with audio, solved, and slight delay when zooming in on the microscopic slides)

Joys:

I can never go back to teaching pathology in a real classroom, because this is inferior education. My joy is knowing, for certain, that online pathology courses are vastly superior to real warm body lectures and real laboratories, in the real world. My joy is also knowing that 3 out of the 16 weeks of the course must, alas, be taught personally in the Caribbean, due to LCME⁴ requirements, although, for the life of me, I cannot think of a single thing that I can do better in person than online. My joy is also knowing that the gentlemen who run medical schools will finally kill their sacred cow and allow online courses because:

- 1) they finally realize it is better.
- 2) they also figure out it is 10 times cheaper.
- 3) their students are ALREADY showing massive class absenteeism and are using online resources

My joy is also knowing offshore and third world medical schools can finally have the benefits of independent USA level professors.

Conclusion:

In the autumn of 2009, two things are pretty obvious to me:

- 1) An online pathology course is superior to real classrooms and labs, as well as infinitely less expensive.
- 2) Our economy is showing no real evidence of getting better in the near future.

Medical schools traditionally have shown great hesitancy towards online courses, either because they feel the need to justify the phenomenally high tuitions, accreditation pressures, or perhaps plain old stuffy arrogance that the students need to be near the professors' bodies. We will soon see an epidemic of ending of these erroneous attitudes.

References:

1. <http://www.dimdim.com/>
2. <http://www.skype.com/>
3. The FPX (FLashpiX) image format (file suffix) is a proprietary format developed by Kodak labs, now largely abandoned. Huge (100 MB) image files using this format were originally used by the University of Iowa in developing its virtual histopathology online resource. This image format is very easily viewed as virtual microscopy using the Live Pix 2.0 Deluxe[®] viewer, available at Amazon.com for \$6.99
4. Liaison Committee on Medical Education policy on distance learning (<http://www.lcme.org/distancelearning.pdf>)