Introduction

What, if anything, differentiates the learning experience at an Ivy League school, such as Harvard, from other academic institutions, such as UHCL? To answer this question, I decided to view as many YouTube videos as possible from Ivy League institutions in my respective discipline. Two common themes emerged from watching these videos.

- **There is a great depth and breadth of intellectual engagement.** Students are extremely engaged, at a very deep level, in the learning process.
- **There is a sense of the world as a community.** These institutions recognize that one of their roles is the betterment of society.

There is an immense pressure to convey an extensive amount of knowledge to students within one semester. This pressure is magnified when the course is a graduate course that serves as a prerequisite to one or more other classes within the program. One potential result is a learning environment, devoid of the human spirit, where learning is a mechanical, but very stale process.

In order to promote an electrifying learning environment where the class comes alive, it is important to be passionate about teaching, challenge students, and engage students. Likewise, it is important for students to be fearless in their learning, intellectually adventurous, and willing to question any prepackaged canned answer presented to them.

For this situation to occur, the instructor needs to be open to an outbreak of spontaneous dialogue and students need to have the courage to ask questions based on their curiosity. We want a setting where students may transform their fears about a subject or themselves into an excitement of recognizing an infinite number of intellectual possibilities. This enables students to mature both intellectually and personally.

The question arises as to how to promote sincere dialogue within the classroom without sacrificing any of the course content. The solution was to create a collection of 51 YouTube videos that students could watch prior to attending class and thus allow more class time for spontaneous dialogue.

These videos received very good feedback within the local UHCL and the global communities. Producing YouTube videos can easily be replicated for any other course at a modest cost.
1. Originality

I created two types of YouTube videos for my courses in 2009. The first approach was to create 38 videos to supplement a graduate Database course. The database course is a required course for all Computer Science and Computer Information Systems majors. It is offered as both a pure Web-based course and also face-to-face. As a required course, it usually has very high enrollment (42 students in the Fall, 2009 sections).

Having taught this course 20 times, I have created an extensive amount of resources for the course including 307 pages of course notes, several flash tutorials, and 20 WebCT quizzes. Students are expected to read the notes, take quizzes on material prior to class, then attend class “knowing what they don’t know.” Two historical problems with the course is that online students miss out on the face-to-face lectures and with such a large class, it is hard for students get clarification on complex topics.

The intent of creating the YouTube videos was to address these problems. By offloading my lectures into videos, students can rewind and review each topic multiple times until they fully understand a concept. When students come to class, they know what they did not know before coming to class. Thus, students are focused on the deficiencies and their questions can be resolved quicker. Most importantly, more time may be spent in dialogue within the classroom.

A second approach was to create videos focused on students’ projects. This was done in a course call Computer Human Interaction, where students have an extensive amount of creative freedom to explore innovative ways of interacting with computers (e.g. Brain Machine Interaction). There were 4 students enrolled in the course. Videotaping students created a very cooperative environment among students. Besides creating videos within the classroom, students’ work was showcased at the UHCL Fall, 2009 Open House and a video was place on YouTube. A total of 13 videos were produced for this course. Since I was quite involved in the video creation process with the students, students viewed me as a co-creator in this process. This evolved into a very special bond between me and my students.

These videos are not just single shoots of a lecture. They include professional introductions, multiple camera angles, and non-linear editing (transitions between scenes). Each video takes about 6 hours to shoot, edit, and upload. My latest video (http://www.youtube.com/watch?v=bqbSlbAulzA) shows off some of my production capabilities.

A search on YouTube (conducted 2/24/10) reveals that the rest of the full-time/part-time UHCL faculty have collectively produced 2 videos on an individual basis (this excludes promotional videos for Political Science, Communications, and the writing center). Thus, my 51 videos account for more than 96% of the UHCL’s faculty presence on YouTube.
2. Rationale

I recall the frustration as an undergraduate having professors that knew their material, but could not convey it effectively to students. Our textbooks were extremely technical manuals that were written for very seasoned professionals. Also, there were no Teaching Assistants in my discipline. With very poor instructors and no educational resource support it was an extremely frustrating experience. As a teacher, I am very moved to minimize the suffering of all new students throughout the world in this regard.

Incorporating videos in the learning process allows students to review a video numerous times until they comprehend a concept. This is extremely important as many academic institutions expand their Web-based course inventory. The videos allow online students to get many of the benefits of a face-to-face in the event they are unable to attend lectures.

Effective teaching seeks to engage students. I thought my courses were engaging even before creating YouTube videos, but I still wanted my courses to be better. After studying the videos from Ivy League classrooms, I realized that I wanted my teaching to be of world-class quality.

3. Effectiveness

A YouTube search on the “Database course” lists 15 of my videos in the top 16 positions. So, these videos have received a lot of attention. As of February 28, 2010, my 51 videos have received a total of 31,747 hits with 61 subscribers. On March 24, 2010 there were a total of 37,168 hits. This represents 5,421 hits in less than 1 month. Table 1 shows the breakdown by geographic region.

<table>
<thead>
<tr>
<th>Region</th>
<th>Hits (2/28/10)</th>
<th>Hits (3/24/10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>12,941.</td>
<td>15,079.</td>
</tr>
<tr>
<td>Asia/India</td>
<td>7,938.</td>
<td>9,476.</td>
</tr>
<tr>
<td>Africa</td>
<td>546.</td>
<td>672.</td>
</tr>
<tr>
<td>Europe</td>
<td>6,575.</td>
<td>7,602.</td>
</tr>
<tr>
<td>Middle East</td>
<td>1,428.</td>
<td>1,495.</td>
</tr>
<tr>
<td>South America</td>
<td>211.</td>
<td>288.</td>
</tr>
<tr>
<td>Other (e.g. Australia)</td>
<td>2108.</td>
<td>2556.</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>31,747.</strong></td>
<td><strong>37,168.</strong></td>
</tr>
</tbody>
</table>
YouTube also provides some very insightful analysis of the YouTube videos. The screenshot below shows the geographic density of the views (the darker the green means more viewing activity). The daily hit rate gives an idea of how many students are actually watching the video.
The Discovery feature of YouTube shows you how people reached a particular video. From a teaching perspective, provides insight into keyword association. For example, a student might have found this database video by typing “Peoplesoft.”

Another nice feature of YouTube is called “Hot Spots.” This allows an instructor to know when a video has captured a student’s attention or when students have “tuned out.” This is an excellent feedback loop for the instructor.
Below are all the unsolicited unedited student comments that I have received. Those comments in bold and underlined are from non-UHCL students.

- **Thanks for video. I finally understood how it works.**
- **Really to the point tutorials.**
- **thank you, very helpful**
- **very creative**
- **wow, helped us a lot!, ty!**
- **Great explanation. Very clear and nice example. Thanks.**
- **Thanks for making things clear**
- Professor xxxx..Your lectures helped me a lot to understand database concepts..thanks a ton for posting them :-)
- Perfect explanation ..thank you..
- **Really clear explanation.**
- **Thanks. That really helpful.**
- **very good**
- **Thank you mister, that has helped me to understand the topic.**
- **Awesome stuff man**
- **SO COOLL! Awesome stuff!**
- **Thank you sooo much! Just reviewing my slides didn't help.. the video is just something else! Thanks!**
- **Thanx dr. XXXX.**
  - We are studying for a database final exam and your video did enlighten us and helped us...
  - Thank you very much
- **sweet intro effects and music**
- **It sure did help for my database exam tomorrow! Just wish I had watched it before my quizz...**
- **Very helpful. Man I wish my professors did this sort of thing back when I was in college.**
Below is an unsolicited letter from a student in Portugal. **He was so impressed by the videos that he wants to attend UHCL for at least one semester.**

Dr. [Redacted]

I don’t know if you remember from last summer, around September. That thank’s to your tutorial videos from youtube about [Redacted], I passed my exam that was needed to finish my course.

I am now doing my Master’s Degree and in some sort thanks to you.

This last week, when I was preparing my papers for applying to [Redacted], I got the craziest idea.

Is it possible that a student like me, doing the Master’s degree in [Redacted] at "Faculdade de Ciências e Tecnologia" could in any way go for one semester or one year study at UHCL?

I already talked about this possibility with my coordinator, and he said its only a question that your university accept me.

Could we make this work?

Best regards,
Filipe Emanuel dos Santos Albuquerque Barroso
youtube
Another unsolicited letter from a professional student in Germany.

Hello Dr. [Name],

I have been working as a software architect in Germany for 12 years and am considering doing my Doctorate back at University. Whilst searching for some theoretical information on [Subject 1] and [Subject 2] and Calculus I stumbled across your lectures and was very impressed. Many thanks for sharing these gems with the internet community. Do you have any others available? I would be especially interested in [Subject 3] or [Subject 4].

And once again fantastic work 😊

Cheers Alex Chilton
4. Transferability

My techniques are easily transferable to any other course in any school irrespective of class size or content. Financially, the hardware/software equipment may be purchased for about 1053 dollars. Below is a description of materials/equipment used for making the videos:

1) Adobe software $300
2) Camcorder $600
3) Tripod $50
4) Two sets of lights $50
5) 4x8 whiteboard $13
6) Border trim (2) $10
6) 10 lime green sheets $30

Setup in my home office