

**CTL Fellows 2015-2016**

**Final Report**

**Video Production**

I produced two pre-laboratory videos to pilot this semester in Chem 312. I chose two of the most conceptually difficult laboratory exercises: infrared spectroscopy (IR) and cyclic voltammetry (CV). Based on workshopping the project with the CTL Fellows, I revised my initial vision for the videos and focused on (1) developing basic theoretical concepts that the students needed to understand the lab and (2) asking quiz questions that forced students to apply their existing chemical knowledge to this new instrumental method. After discussion and reflection, I realized that these priorities were more important and demonstrating lab techniques, which I could show the students personally during lab. For this reason, the final videos (produced in Camtasia Studio) were primarily narrated Powerpoint with no live video. The videos were each ~10 minutes long and includes several embedded quiz questions and a final interactive component that allowed students to submit questions. As part of this project, I learned to embed quizzing in videos and to export the videos as Moodle-compatible SCORM packages that automatically report student quiz scores to the Moodle gradebook. In general, I found Camtasia to be user-friendly and supported by excellent online resources.

*Tips for Future Videos / Other Faculty:*

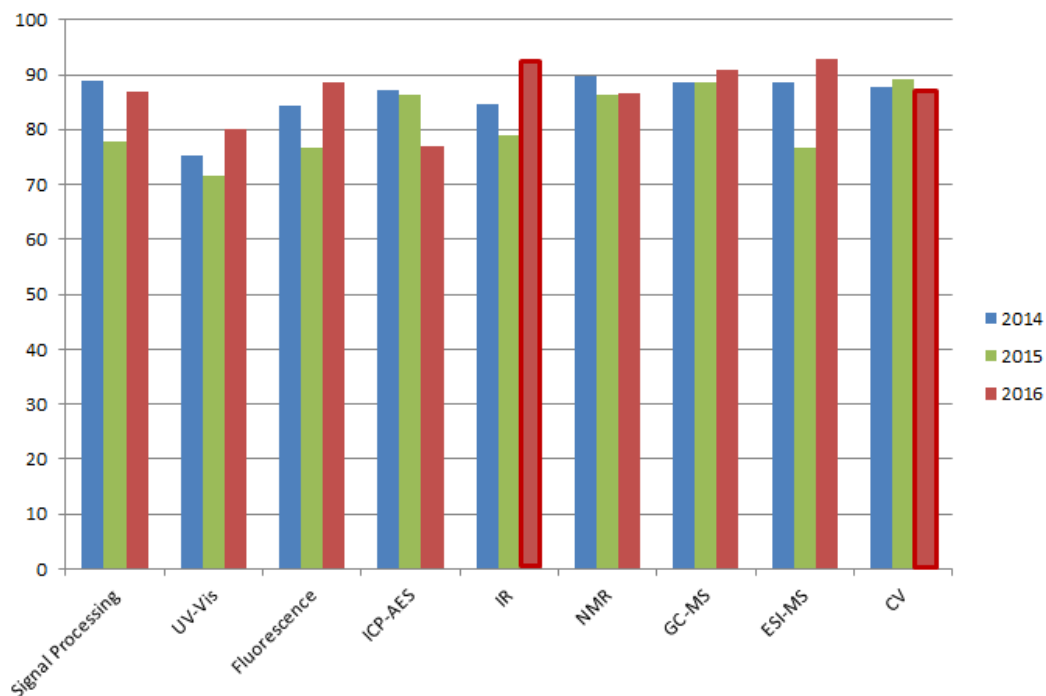
1. *Spend plenty of time determining goals for the videos before embarking on the technology side of video production.*
2. *Approach quiz questions from the perspective: "What would I ask students if I were in the room with them?" For me, this yielded more useful questions that did not simply ask students to repeat information from the video.*
3. *Produce videos from a script. It is surprisingly difficult to ad-lib.*
4. *Sound quality improves with a headset compared to a stand-alone microphone.*
5. *During and after filming, consider how the cursor can be used to emphasize parts of the image, or how it might distract students.*
6. *Anecdotal evidence and some informal readings I did suggested that videos be kept relatively short, e.g. 5-15 min.*

**Student Outcomes**

Qualitatively, I felt that the students were better prepared for the IR and CV labs this semester, and our conversations during lab felt more productive. The students were also generally positive about the pre-lab videos. An unanticipated benefit of the videos was that students could re-view them while writing the lab report and while studying for exams.

It is difficult to make precise comparisons of lab report scores either between years (since different students are in the course) or between labs (since they vary in difficulty). Nevertheless, it appears that the IR video may have improved student scores on the IR lab report relative to past years (Figure 1). No effect was seen on the grades for the CV lab reports. This may be

because the IR lab report guidelines ask students to develop more theory than the CV report guidelines, which are mostly descriptive.



**Figure 1.** Average scores for each lab report during the last three years of Chem 312 sections. The data for the IR and CV labs that made use of the pre-laboratory videos are highlighted. Enrollment varied from 6-8 students per year.

### Future Development

The current videos could be improved by refining a few of the automated answers to the quiz questions and occasionally editing the narration to provide more direction with the respect to the quizzing. Additionally, based on the success of these two videos, I hope to create additional videos for other laboratory exercises. My next priority will be to develop a video for the UV-Vis lab, which historically has resulted in lower scoring reports than other labs (Figure 1). Additionally, faculty from physics and biology spoke with me after my Common Hour presentation, and I am hoping to share some of what I've learned in Camtasia with these colleagues over the summer.