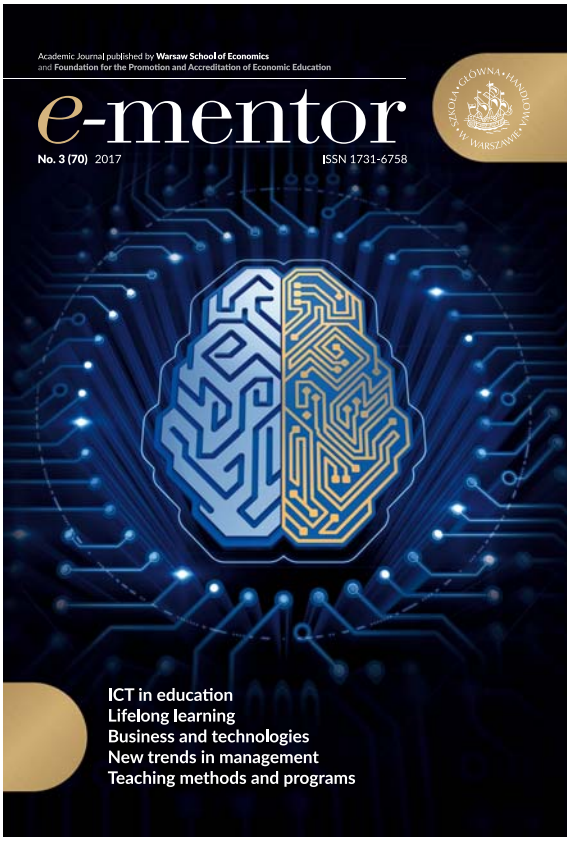
e-mentor
DWUMIESIĘCZNIK SZKOŁY GŁÓWNEJ HANDLOWEJ W WARSZAWIE
WSPÓŁWYDAWCA: FUNDACJA PROMOCJI I AKREDYTACJ KIERUNKÓW EKONOMICZNYCH



2017, nr 3 (70)

Layne A. Morsch, *Student Authored Video Vignettes in Chemistry*, „e-mentor" 2017, nr 3(70), s. 25–32, http://dx.doi.org/10.15219/em70.1303.

Student Authored Video Vignettes in Chemistry

Layne A. Morsch

Video has had a profound impact on education in general, and on chemical education specifically. Many faculty members have found the ability to post video lecture material for students a valuable tool in fostering more interactive and dynamic learning in face-to-face classes (Read & Lancaster, 2012, pp. 13–16) or in improving student laboratory techniques (DeMeo, 2001, pp. 373–379). Many reviews of video lectures have been published across higher education fields (Kay, 2012, pp. 820–831; McGarr, 2009, pp. 309–321; O'Callaghan et. al., 2017, pp. 399–415). The video lecture has become the centerpiece of most flipped learning classes (DeLozier & Rhodes, 2017, pp. 141–151). There is great variety in the delivery of video lectures; in reviewing video lectures from 50 different online courses, Crook and Schofield (2017, pp. 56–64) found 16 different styles of presentation.

Background

Recently, there has been interest in engaging students in the video creation process. This encourages students to understand course content thoroughly in order to be able to explain it to others. Student-authored video assignments have been reported in a variety of higher education courses. For example, composition courses have been designed to integrate video with more typical writing assignments in order to develop the ability to express oneself across multiple modalities (Baepler & Reynolds, 2014, pp. 122–136). Student-generated course videos were used in a nursing curriculum to improve curricular as well as cross-curricular competencies (Pereira et. al., 2014, pp. 580–590). In organic chemistry lab courses, students have been asked to prepare video demonstrations of laboratory techniques before attending the lab (Jordan et. al., 2016, pp. 141–145) or to improve general chemistry lab skills by creating a similar technique video (Erdmann & March, 2014, pp. 650–657). Digital badges, based on videos of students engaging in laboratory skills, have been incorporated into introductory laboratories to assess student learning (Hensiek et. al., 2016, pp. 1847–1854; Hensiek et. al., 2017, pp. 28–33). Biochemistry students have been challenged to develop videos in groups to explain a biochemical area of interest (Ryan, 2013, pp. 24–41). Video vignettes have been used in a summary fashion, integrating material from a series of courses in a Master's level program (Lancaster, 2014; The Chemistry Vignettes Website).

The process of creating student-authored video assignments that would encourage students to engage with complicated course material, and that would be useful for enhancing chemistry and communication skills, requires an iterative process. Incorporating new types of assignments can be challenging for many professors, as most do not have explicit training in education or curriculum development. This iterative process is described below, to demonstrate that incorporating new technologies into course assignments may reveal some unexpected challenges. However, with thoughtful reflection, a valuable assignment can be molded.

Minimizing Technological Learning Curve

Camtasia Studio (Windows) and iMovie (Mac) were used for video recording and editing over 130 videos to prepare organic chemistry courses for a flipped learning format. While each of these video-editing programs is quite powerful, they were each deemed to have a significant learning curve for competency in their use. The students taking organic chemistry 1 and 2 at the University of Illinois Springfield (UIS) were all required to have iPad devices. (Due to the potential additional cost for students that did not already have access to an iPad, LibreText, a free open educational resource, was used in place of a traditional textbook.) The iPad provided each student with the capacity to engage with video authoring active learning assignments. Apps that would allow the students to generate video vignettes on the iPad were explored.

Three apps were eventually selected to record and edit the videos:

- Adobe Spark Video (originally called Adobe Voice),
- Explain Everything,
- iMovie (iPad app version).

Each app has its advantages, depending on the video content being created. Adobe Spark Video is the simplest to use. It allows importing of images (which could be created with ChemDraw or other chemical structure drawing software) into each "slide". Then one can record one's voice narrating the information relating to that picture. By repeating this procedure, a movie is generated with a series of images and explanations. There is also a pre-defined set of musical backgrounds that can be added to the presentation for aesthetic effect. The entire set of narrated slides with music can be exported as a video, once complete. The limitation of Adobe Spark Video (Figure 1) is that it does not allow for real-time recording of drawing or showing of motion, which is often required to explain organic chemistry topics (such as mechanisms or resonance).

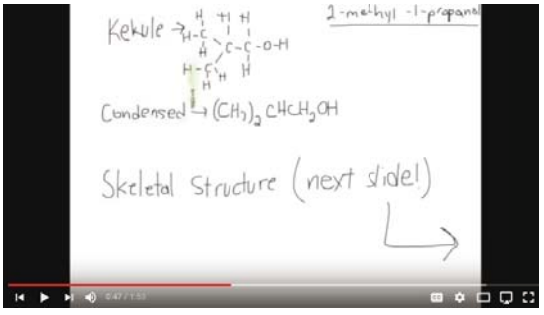
Figure 1. Sample Adobe Spark Video vignette

Source: https://www.youtube.com/watch?v=OC11FsVQYwk&list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i&index=9

Figure 2. Sample Explain Everything vignette

Source: https://www.youtube.com/watch?v=nJnHGyM1S9c&index=8&list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i&t=1s

Figure 3. Sample vignette using iMovie to integrate Adobe Spark Video and Explain Everything



Source: https://www.youtube.com/watch?v=Gf5Y80uGe9M&index=7&list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i

Examples of video vignettes created by UIS undergraduate students can be found on the YouTube Channel – Video Vignettes for Organic Chemistry https://www.youtube.com/playlist?list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i.

Explain Everything is a much more versatile app (Figure 2), which allows for recording drawing and narration simultaneously. It also allows for the importing of images; each image can then be arranged on a page and drawn on during the video recording. Similar to Adobe Spark Video, each "slide" allows the recording of audio relating to that slide and, upon completion of the project, the entire set of slides can be exported as a video. Due to the broad capability of this app and the improved drawing capability that appeared with the release of the iPad Pro and Apple Pencil, I replaced my previous Camtasia Studio setup with Explain Everything on an iPad Pro for my own lecture videos.

iMovie was introduced to help students that wanted to incorporate both the Adobe Spark Video and Explain Everything apps into a single video (Figure 3). (However, it was later determined that merging of videos could be accomplished within Explain Everything, without the use of a third app.) Within iMovie, a project could be started and each of the previously exported videos from other apps could be imported, arranged, edited and then exported as a single video.

Student Information

The video vignettes assignment was introduced in organic chemistry 1 classes (fall and summer) and organic chemistry 2 classes (spring) at UIS. The class sizes range from 18-24 in the summer to 60–65 in the fall. The students are a mixture of biology, chemistry, and clinical lab science majors, with a few that are planning post graduate study in the health sciences but are in a non-science major. The course is a second year course in the chemistry curriculum, but many students in other majors take the course later in their college careers.

Morphing of an Assignment

What follows is an iterative examination of the video vignette assignment as it was modified based on instructor reflection and student feedback. Unlike many manuscripts, bad ideas and problematic aspects of the assignment have been included purposefully to illustrate this process.

Fall 2014
#Videos assigned: 1
Video length: 5–10 minutes
Points for videos/points in class: 25/630

I gave the first student-authored video vignette assignment in my organic chemistry 1 course, during Fall semester of 2014. A list of all course topics was given to the class. Each student was asked to work in a group of three students to create a video on one topic chosen from the list. The groups were randomly selected and assigned. In order to get a wide variety of content videos, each subject could be chosen by only one group, with the first group selecting the topic given priority. The videos were expected to be between 5–10 minutes long and to include examples of how the concept can be applied to problem solving. Following completion of a first draft of the video, each group peer reviewed two other group videos and gave feedback to the authors. Then the groups were allowed to edit their original video to make a final draft video for grading by the instructor. A rubric was included, which explained the criteria that the projects would be graded on. As grading of the final drafts was undertaken, a glaring omission in the criteria appeared. There were points for whether the material was easy to follow, well structured, thoroughly explained and at the appropriate level. However, there were no points assigned for the chemistry actually being accurate (Figure 4).

What Worked Well: The students adapted to the technology easily. The students were able to make presentations about chemistry without using class time.

What Needed Improvement: The students mostly focused on the simplest material. The videos were too long. The rubric did not reward students for having accurate chemical information.

Spring 2015
#Videos assigned: 3
Video length: 5–10 minutes
Points for videos/points in class: 70/670

Groups of students were assigned. They were asked to create two videos as a group and one video individually. This time, the topics were limited to topics that were covered on each of the three exams during the course (not including the final exam). Each video was due before the corresponding exam, so that creating the video could serve as a study aid. As with the previous course, they completed both a rough draft and a final draft, with student reviews of the videos designed to give feedback for the groups or individuals to improve their final drafts. Content accuracy was now included and comprised half the points for the final draft. This replaced other criteria, including "material was easy to follow", "graphics enhanced understanding of material", and "spelling and grammar correct". While grading the Fall 2014 videos, there had been no significant issues relating to these concepts. Student surveys were given at the completion of the assignment.

Figure 4. First video vignette rubric

CHE 267 Video Vignette Project Grade Student_____
Fall 2014

Instructor Evaluation:

Criteria	Points Possible	Points
Initial Draft – complete and on time	5	
Review -1	2.5	
Review -2	2.5	
Description of changes after review	2	
Audio was clear and understandable	1	
Images/graphics were clear	1	
Images/graphics enhanced understanding of material	1	
The material was easy to follow	2	
The presentation was well structured	2	
The material was thoroughly explained	2	
The level was appropriate for CHE 267 students	1	
The examples were helpful and related to main point	2	
Spelling and grammar correct	1	
Total	**25**	

Source: Author's research.

Based on student responses and the videos submitted, the nature and value of the video assignment was reviewed. Many students complained that the groups didn't function well and that some partners were not contributing to the assignment. While this was partially addressed with reduced grades for the non-contributing partners, it did not encourage all students to take advantage of this assignment to improve their understanding of relevant chemical principles. It was also evident that most groups tried to choose the simplest possible concepts for their video. This thwarted the idea that having to explain difficult concepts will help students improve their understanding of organic chemistry. The students responded when surveyed that they didn't feel that they learned very much from watching and reviewing the peer videos. The learning objectives of the assignment were also reflected on and the creation of a final draft video seemed to be more about video production skills than about learning chemistry content and using verbal and symbolic language to explain it to others.

What Worked Well: Points focused on accurate chemical information.

What Needed Improvement: Multiple drafts focused on non-chemistry learning. Reviewing other students' videos was not a time effective learning tool. Groups were not effective in encouraging all students to learn from authoring the videos. The simplest concepts were often selected for the videos.

Summer 2015
#Videos assigned: 3
Video length: 2–3 minutes
Points for videos/points in class: 30/470

Based on lessons learned through the first two semesters of employing video vignettes, this semester each student was asked to create three individual videos. During summer, this course includes two exams and a final exam. Students were required to select each video topic from a list of course concepts that would be covered on the corresponding class exam. The video was due before the corresponding exam, so that creating the video could aid students in preparing for the exam. Final drafts were eliminated based on the previous analysis of learning objectives; I graded each video was graded without the use of student reviews. Since students had more videos to create, the time for each video was reduced from 5–10 minutes to 2–3 minutes per video. Students were given an additional instruction on choosing a topic:

Most important!! – Choose a topic that you don't understand well. Working on these videos will require you to learn more about the topics you choose.

I explained to the students that selecting a topic that is already well understood will be a waste of their time. The value in the assignment comes in having to learn an unfamiliar topic well enough to explain it to others. This was the most successful assignment yet, according to the student responses on whether creating videos aided in their learning. A new idea began to dawn in my mind regarding the potential increased learning that could happen if students had to explain more ideas from the course.

What Worked Well: Individual videos, single drafts, eliminating peer review and shorter videos were all successfully implemented.

What Needed Improvement: There were only three videos while the course covered 13 chapters.

Fall 2015
#Videos assigned: 13
Video length: 1–2 minutes
Points for videos/points in class: 50/600

My experience from this semester should serve as a warning: do not get carried away with a good idea. As I prepared for the Fall semester, I decided that if students in a shortened summer class could learn three concepts from organic chemistry really well, by creating three videos, wouldn't it be great if each student learned one concept really well from each of the 13 chapters covered in the course. The assignment this semester was to create one video per student per chapter, or 13 videos each. As this would result in ~780 student-authored videos during the semester, a grading scheme based on discussions with several K-12 teacher-colleagues was developed. The first video from each student was graded to make sure all students had feedback letting them know if they were successfully meeting the requirements. Then three of the remaining 12 videos authored by each student were randomly selected for grading. iTunes U was used to deliver the course materials and assignments. Even before the end of the term, the difficulties this assignment was causing the students became evident. Before registration for organic chemistry 2 opened, I decided not to have students create one video per chapter again. Not only was it causing the students to spend too much time with the technology, it was a logistical nightmare for the instructor.

What Worked Well: Clear rubric (Figure 5) and short videos.

What Needed Improvement: The number of videos was unmanageable, both for student authoring and faculty grading.

Spring 2016
#Videos assigned: 4
Video length: 1–2 minutes
Points for videos/points in class: 40/640

This semester began by returning to the Summer 2015 version of the assignment, since that had been the most successful version of this video vignettes experiment so far. The only difference from summer is inclusion of an extra exam, so there were four videos as opposed to three. However, about halfway through the term another idea was sparked. While I

Figure 5. Updated rubric for video vignettes assignment

Assignment: Video Vignettes using Explain Everything

Scoring:

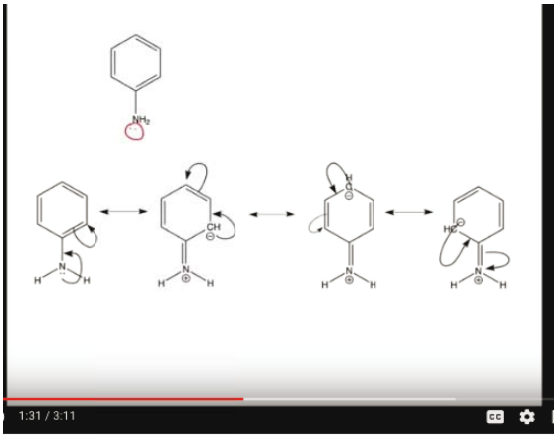
Criteria	Points
Chemistry content is accurate	5
Audio/Images clear and understandable	1
Introduction	1
Conclusion	1
The video fit into 1-2 minutes	1
Presentation is clear and focused	1
Total	**10**

Source: Author's research.

was at a conference, there was a discussion on having students create crowd-sourced course materials for a Bioorganic chemistry class (Tartaro et. al., 2015, pp. 221–224). At the same time, the students in organic chemistry courses at UIS were requesting more problems to work on outside of class. Since LibreText had been used as the course textbook for the last few semesters, the students didn't have any publisher-provided homework system that they were forced to purchase. They only had the few problems per section that were integrated into LibreText at that time. I developed some problems, with video solutions, but due to the time-consuming nature of such an endeavor, they were not available for every chapter. The solution was to begin using the video vignettes assignment as a crowd-sourced homework problem generator (Figure 6), with video solutions. The pedagogical advantage of having the students create these problem-based videos was that the videos were now forcing them to engage with the material in the same way they would on the exam (for the symbolic aspect of drawing out solutions), with the added feature of requiring them to understand concepts well enough to explain them verbally as well (Figure 7).

Figure 6. Sample vignette with a solution to a problem:

https://www.youtube.com/watch?v=Rqu8u8Lo5uw&index=23&list=PLZxW9yeYihslHPYF6UHhaR3T75cnZ_Q3i



Source: Author's research.

What Worked Well: Beginning to shift video assignment to exam type problems with video solutions.

What Needed Improvement: Consistency of the assignment. The focus was changed for the last two videos to the new problem-based idea.

Figure 7. Rubric for problem-based video vignettes

Assignment: Video Vignettes using Explain Everything
Scoring:

Criteria	Points
Chemistry content is accurate	7
Question submitted as image or pdf	1
The concept selected was narrow enough to be explained well	1
The video was focused on solving the problem stated	1
Total	**10**

Source: Author's research.

Summer 2016
#Videos assigned: 3
Video length: 1–2 minutes
Points for videos/points in class: 30/470

During Summer 2016, I continued the system of one video per exam. The spring modification of having one video per exam, where the video was a solution to a problem type that would be found on the exam, was carried through the summer organic chemistry 1 course. The previous type of video vignette that merely explained a topic was discontinued.

What Worked Well: The solutions to relevant organic chemistry problems, similar to exam questions.

What Needed Improvement: There were some complicated problems students were attempting to answer that required videos longer than 2 minutes.

Fall 2016

There was no video vignette assignment during organic chemistry lecture for Fall 2016 due to the introduction of a new technology-based assignment. To avoid technology overload, which could limit the time spent learning organic chemistry concepts, the video vignette assignment was reserved for the following semester.

Spring 2017
#Videos assigned: 4
Video length: under 3 minutes
Points for videos/points in class: 40/640

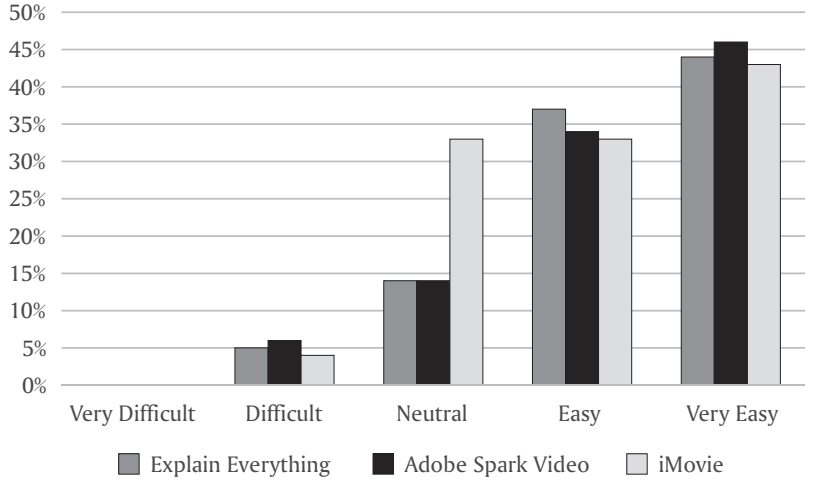
Spring 2017 was an opportunity to return to the video vignette assignments. I decided to repeat the design used during Summer 2016, with students submitting problems with video solutions. The students submitted one video per exam, which means four videos for a non-summer course. After considering all the previous iterations of the assignment, this version was determined to offer the best exam preparation for students, as they were asked to practice explaining exam-type problems before taking an exam on related material.

Data

Students were surveyed throughout the 2015-16 academic year. This included two sections of organic chemistry 1 and one section of organic chemistry 2, with a total of 124 students responding. The surveys were delivered online via Qualtrics. Most students found the additional technology easy to use and very few struggled with the apps (Figure 8). They found iMovie on the iPad a bit more difficult to use than the other apps. This encouraged a shift to finding ways to use Explain Everything for all videos, which is the current technology being used.

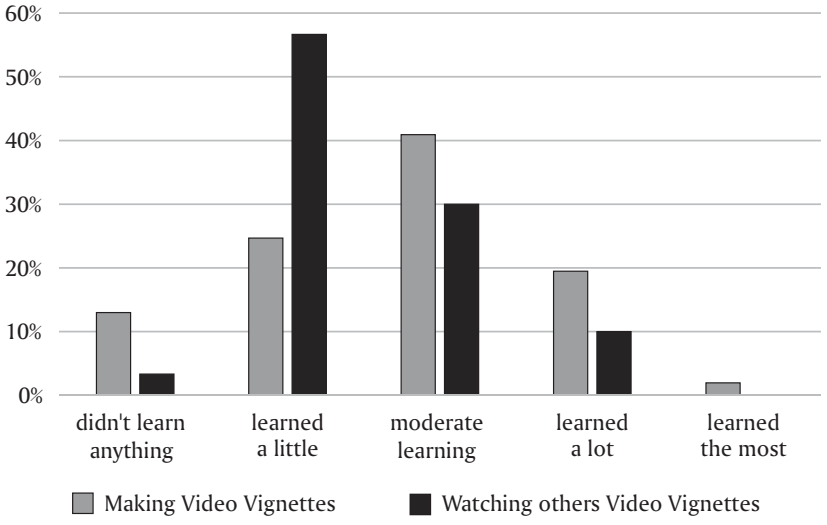
In the surveys, students were asked to rate the value of different aspects of the class, including the video vignettes. As mentioned above, the students perceived that watching other groups' videos was less valuable for learning overall (Figure 9). Students claimed to have not learned anything, which prompted an addition to the instructions given. I challenged the students to select a topic that they did not fully understand, so that the video creation process would force them to further explore the material for deeper understanding. Taking this into consideration, the student responses showed that over 60% of the class felt that the assignment provided at least moderate learning. The bulk of the course instruction focused on 60–70 video lectures and active learning/problem solving sessions during each class meeting; the four videos the students created supplemented these primary learning tools. Over 80% of the students rated the lecture videos and in-class problem solving sessions as "learned a lot" or "learned the most".

Figure 8. Percentage of student responses to "Ease of use of class materials" for Fall 2015 through Summer 2016



Source: Author's research.

Figure 9. Percentage of student responses to questions: *How much did you learn from making Video Vignettes?* (2015 through 2016) and *How much did you learn from watching/commenting on other group videos?* (2015).



Source: Author's research.

Conclusions

Incorporating video vignettes into organic chemistry has allowed the practice of student presentation skills to be included in course assignments, without requiring large amounts of class time. Students adapted quickly to the technology-based assignments, especially when they worked on them individually, rather than in groups. This was evidenced in the ratings of the ease of use for each of the video apps. The majority of students surveyed reported performing better on exam questions on their chosen video vignette topics. They also reported learning more from creating their own videos than from peer review of other student videos.

The rubric for the assignment was modified as the assignment changed, with each of the final two rubrics seen in Figures 5 and 7 working well, based on the assignment type. The rubric in Figure 5 focused on important features when explaining a topic, including an appropriate introduction and conclusion. The problem-based rubric in Figure 7 focuses primarily on correct chemistry when explaining the solution to an organic chemistry problem.

Several of the assignments were effective in meeting the goal of incorporating presentations into organic chemistry, where students are required to explain chemistry using words and symbolic representations. Ultimately, having students solve exam style questions—while showing they understand the chemistry behind the solution well enough to explain their reasoning verbally—seems to be the most valuable use of the video vignette assignment.

This iterative process of instructional design led to a valuable assignment that might otherwise have been abandoned early in the process, if I had not taken the opportunity to reflect on what was working well and what could be improved. The inclusion of mistakes and non-optimal choices made during the process will hopefully be informative for others as they endeavor to create their own novel course assignments.

References

Adobe Spark Video. Retrieved from https://spark.adobe.com.

Baepler, P., & Reynolds, T. (2014). The digital manifesto: Engaging student writers with digital video assignments. *Computers and Composition*, *34*, 122–136. http://dx.doi.org/10.1016/j.compcom.2014.10.002

Crook, C., & Schofield, L. (2017). The video lecture. *The Internet and Higher Education*. *34*, 56–64. http://dx.doi.org/10.1016/j.iheduc.2017.05.003

DeLozier, S.J., & Rhodes, M.G. (2017). Flipped classrooms: A review of key ideas and recommendations for practice. *Educational Psychology Review*, *29*, 141–151. http://dx.doi.org/10.1007/s10648-015-9356-9

DeMeo, S. (2001). Teaching chemical technique. A review of the literature. *The Journal of Chemical Education*, *78*, 373–379. http://dx.doi.org/10.1021/ed078p373

Erdmann, M.A., & March, J.L. (2014). Video reports as a novel alternative assessment in the undergraduate chemistry laboratory. *Chemistry Education Research and Practice, 15*, 650–657.

Explain Everything. Retrieved from https://explaineverything.com.

Hensiek, S., DeKorver, B.K., Harwood, C.J., Fish, J., O'Shea, K., & Towns, M. (2016). Improving and assessing student hands-on laboratory skills through digital badging. *The Journal of Chemical Education*, *93*(11), 1847–1854. http://dx.doi.org/10.1021/acs.jchemed.6b00234

Hensiek, S., DeKorver, B.K., Harwood, C.J., Fish, J., O'Shea, K., & Towns, M. (2017). Digital badges in science: A novel approach to the assessment of student learning. *Journal of College Science Teaching*, *46*(3), 28–33. http://dx.doi.org/10.2505/4/jcst17_046_03_28

iMovie. Retrieved from https://www.apple.com/imovie/.

Jordan, J.T., Box, M.C., Eguren, K.E., Parker, T.A., Saraldi-Gallardo, V.M., Wolfe, M.I., & Gallardo-Williams, M.T. (2016). Effectiveness of student-generated video as a teaching tool for an instrumental technique in the organic chemistry laboratory. *The Journal of Chemical Education*, *93*(1), 141–145. http://dx.doi.org/10.1021/acs.jchemed.5b00354

Kay, R.H. (2012). Exploring the use of video podcasts in education: A comprehensive review of the literature. *Computers in Human Behavior*, *28*(3), 820–831. http://dx.doi.org/10.1016/j.chb.2012.01.011

Lancaster S. (2014). Student vignette presentation. *Education in Chemistry*, http://www.rsc.org/eic/2014/03/student-vignette-presentation.

LibreText. Retrieved from https://chem.libretexts.org/LibreTexts/University_of_Illinois%2C_Springfield.

McGarr, O. (2009). A review of podcasting in higher education: Its influence on the traditional lecture. *Australasian Journal of Educational Technology*, *25*(3), 309–321. http://dx.doi.org/10.14742/ajet.1136

O'Callaghan, F. V., Neumann, D.L., Jones, L., & Creed, P.A. (2017). The use of lecture recordings in higher education: A review of institutional, student, and lecturer issues. *Education and Information Technologies*, *22*, 399–415.

Pereira, J., Echeazarra, L., Sanz-Santamaria, S., & Gutierrez, J. (2014). Student-generated online videos to develop cross-curricular and curricular competencies in Nursing Studies. *Computers in Human Behavior*, *31*, 580–590. http://dx.doi.org/10.1016/j.chb.2013.06.011

Qualtrics. Retrieved from https://www.qualtrics.com.

Read, D., & Lancaster, S. (2012). Unlocking video: 24/7 learning for the iPod generation. *Education in Chemistry*, July, 13–16.

Ryan, B. (2013). A walk down the red carpet: students as producers of digital video-based knowledge. *International Journal of Technology Enhanced Learning*, *5*(1), 24–41. http://dx.doi.org/10.1504/IJTEL.2013.055950

Tartaro, A., Goess, B.C., & Winiski, M. (2015). Creative language in a student-generated bioorganic chemistry wiki textbook. *Creativity and Cognition*, 221–224. http://dx.doi.org/10.1145/2757226.2757250

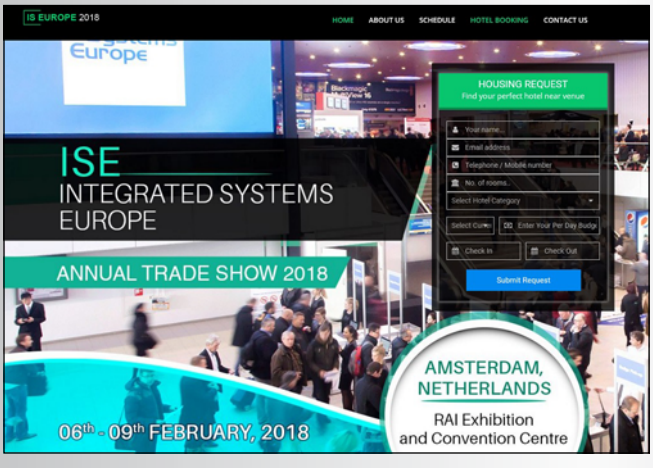
The Chemistry Vignettes Website, Royal Society of Chemistry. Retrieved from http://www.rsc.org/learn-chemistry/resource/listing?searchtext=chemistry%20%2B%20Vignettes&eMediaType=MED00000009.

Student Authored Video Vignettes in Chemistry

Access to video authoring tools has transformed many classrooms, from K-12 to higher education. The concept of flipped learning is one result of this. Much of flipped learning focuses on changes to the lecture component of a course. This paper applies similar concepts to classroom oral presentations. Classroom presentations have long been a valuable tool for encouraging students to engage in deeper learning, as well as practicing disciplinary language skills. Building on reports from other faculty who have used student-authored videos in classes where each student was required to have an iPad, a set of assignments was created. Reflections and attitudes of students relating to the assignment and their own learning were collected through class surveys. The survey results and instructor reflection on improving the assignment is discussed.

Layne Morsch, PhD is an Associate Professor of Organic Chemistry at the University of Illinois Springfield. Dr. Morsch received his Ph. D. in Organic Chemistry from the University of Illinois Chicago in 2002. His research interests focus on using active learning to improve student engagement through flipped classroom pedagogy as well as disciplinary language development utilizing interinstitutional collaborative student partnerships.

WE RECOMMEND



ISE ANNUAL CONFERENCE 2018, 7–9 February 2018, Amsterdam, Netherlands

ISE (INTEGRATED SYSTEMS EUROPE) 2018 is organizing their Annual Conference from 7 Feb to 9 Feb. ISE is the largest AV systems integration show in the world. The annual four-day event, which takes place at the RAI Amsterdam every February, is organised and run by Integrated Systems Events. Integrated Systems Events is a joint venture between InfoComm International and CEDIA – the two leading industry associations for the global audiovisual industry. ISE 2018 will be held in Amsterdam.
More information: **http://ise2018.org/**