

As we make this transition to increased online learning, especially in the presentation of online wet chemistry and food analysis labs, IFT invites those who are interested in developing a community resource to reach out to Alexandra Santau asantau@ift.org to be connected to this resource as it is being formed.

The COVID-19 outbreak forced many educators head-first into remote teaching styles. The outbreak uprooted the spring semester of 2020 with little notice. Quickly pivoting to translate face-to-face courses into effective online classes was a huge challenge! Many predict that the need to teach online courses will be with us far into the future. However, if there is a silver lining to the scramble to on-line formats, it is that we now know that on-line delivery can be done effectively—and may offer some advantages to both professors and students. Our sudden shift in traditional delivery methods illuminated many benefits of online teaching, giving us the impetus to invest in creating online content in a more relevant and urgent way.

Today's classroom is increasingly integrated with technologies that give instructors the ability to teach effectively without lecturing face-to-face. Widely available internet connectivity makes it possible for classes to be taught creatively through videos, assignments, and instructive games.

For most, YouTube is the most important platform on the web (Buchner, 2018). Lectures can be posted on YouTube or other platforms, and students can easily listen, watch, and reflect on course content without leaving their residences. Using other platforms like online forums or video conferencing for synchronous online meetings, students can still be encouraged to collaborate with their peers and participate in group projects to achieve the course objectives.

Although online education has grown exponentially as a result of the unfortunate COVID-19 outbreak, we are to grasp the inherent benefits of online course delivery provides, despite the flurried pace we were forced into as we developed on-line courses last spring. Specifically:

- With asynchronous (view anytime) presentations students have increased flexibility in terms of time, place, speed, and hearing ability to view course content (Dinmore, 2019).
- With additional instructor vigilance there can be a sense of personalization and peer presence for the learner (Borup et al. 2014).
- Recorded lectures allow for unlimited repetition, revision, and review.
- Higher levels of student engagement can promote increased active learning.
- Many students feel online lectures presented in a less stressful format than in-person learning that allows students to use a higher level of cognition to focus on the materials being presented. The learning environment may be less hindered by stress and distractions that can reduce the level of cognition (Paas & Sweller, 2014).

Some educators have moved to “flipped” classrooms where students watch videos online on their own schedule and then come to class ready to discuss, practice, and ask/answer questions (Bishop & Verleger, 2013). Online asynchronous presentations benefit students by giving them more time for interactive in-class lessons while still giving them the flexibility and availability of online instructions. Other teachers have implemented “blended” classrooms where online and face-to-face instruction are combined. Blended learning can allow for increased creativity and complex thinking while still mitigating the growing complexities of teaching solely in the classroom (Garrison & Kanuka, 2004).

If you are interested in moving your instruction to a blended, flipped, or fully online classroom, you will need to be prepared for creating content that is engaging and informative. This is commonly achieved by using videos. When creating educational videos, keep in mind these important points to optimize your time, and your student's time as well:

- Keep videos as simple as possible, typically focusing on a single or closely related topic.
- Break videos into topics. Optimal video length is six minutes or shorter. Highest engagement was found for videos with a three-minute length (Gruber & Buchner, 2017). Shorter, topical videos make it easier for students to return to a specific area if they have questions or when reviewing the material presented for an exam.
- Segmenting longer videos into multiple sub-topic shorter videos is more effective (Mayer & Moreno, 2003).
- Telling a story through your videos to make it more emotionally appealing, capture your students' attention, create suspense, and make it more authentic/relevant (Koumi, 2006).
- Use "you" and "I" to speak to your audience personally with enthusiasm (Buchner, 2018).
- Give students increased control of their learning (through guiding questions or action oriented tasks) to promote intrinsic motivation and maintain all students' attention (Deci & Ryan, 2000).
- Encourage social interaction through online peer commenting, projects, and question/answer sessions despite no in-person interaction.
- Combine spoken language with pictures (possibly talking head) without too much text for maximal effectiveness (Butcher, 2014).
- Practice videos with a script or talking points before sending it to students.

Supplementing videos with additional resources can be extremely beneficial to the learning experience. This ensures that student engagement is high and that students report that they are given adequate instruction and practice to understand complex ideas and think creatively. Some ways to supplement videos in higher learning include:

- Provide links to supplemental reading and course materials through online textbooks or online journals.
- Use the learning management system (like Blackboard, Moodle, or Google Classrooms), often supported by professionals at your institution.
- Provide practice problems, assignments, and questions that can be submitted and returned promptly with equally prompt feedback from instructor.
- Include discussion forums for students to engage with other students as well as the instructor as needed for help.
- Open lines of communication between student and instructor that can be expected to reach each supportive staff with urgent questions or needs.
- Provide objectives, clearly defined learning plans and expectations that students can view and plan well ahead.
- Add a lab supply list or provide actual required items if you are teaching a highly interactive class such as a lab which requires additional resources. For instance, if

teaching a food chemistry lab, you might need to provide students with actual thermometers, or a list of lab supplies they will need to complete the lab at home.

There are clearly a multitude of beneficial ways to teach online effectively. This is not to say that there are not challenges that can come with this transition. These are a few challenges that instructors who teach online might uniquely face:

- If not given proper means and expectations for interaction, there may be less student engagement.
- Because you won't be able to see student's confused faces when they are lost, instructors need to request feedback through assignments to insure incremental progress. A journal assignment or reflection question can assess when students are unclear.
- Anticipate the additional work load that will go into online teaching, especially while transitioning from the former in-person presentation format.
- Students can feel more isolated from their peers and instructor if not given adequate means of interaction, which can lead to stress and less socialization.
- Administrators need to expect significant added costs in creating content and plan accordingly to provide additional resources.

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