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Using Video Tutorials To Augment Online Teaching

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As more universities look to bring teaching online, our research into the effectiveness of video tutorials can help you make the transition away from the classroom. Through the process of creating videos and testing their application for our students, we've determined some best practices to help other teachers looking to bring more course material online.

The videos

We teach an introductory course called Digital Media Skills, which helps prepare journalism students for upper level multimedia courses, and serves as a university technology requirement for other students. We've developed a catalog of video tutorials for the course, detailing course software such as FinalCutPro, Photoshop and InDesign. You can find the videos online here. The videos are constructed to give the student the specific software skills and knowledge necessary for use in a journalistic context.

Our approach was geared toward creating a flipped class, defined as any combination of interactive activities in the classroom with "computer-based individual instruction" at home (Bishop and Verleger, 2013). Our tutorial videos give students more autonomy, and allow them to come to class with more context about software, so in-class workshop time is more productive.

However, many of the same techniques we used to flip the classroom can be applied toward online learning. The tutorial videos allow students to follow instructions online, and complete assignments outside of the classroom.

Consider the best method of delivery

The first step to bring content online is to strategize which method works best for your materials. Videos are a common tool used in online learning and flipped classrooms. Styles vary from slides to video lectures (Guo et al., 2014), and include "Khan-style" videos, which showcase live, annotated instructor notes on a digital white board.

A study of 6.9 million video watching sessions in four online classes found not all video materials are created equal (Guo et al, 2014). Lecture videos and tutorial videos, for example, should be formatted in different ways. Videos with annotated instructor notes were found to engage students more than slides.

As you develop online teaching materials, work to pair learning outcomes with delivery method. For example, our videos employed the screencast method, through which students can see recorded action within computer software. Screencasts made sense for our course material, as we are teaching students how to use computer programs. Your course content may

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benefit from other methods of delivery.

Keep it short

One key finding across multiple studies is that shorter videos are more engaging for online audiences. Our initial study (Gil & Williams, 2017), where we looked at the way students engaged with the videos based on YouTube analytics, showed similar activity among viewers. Overall, students only watched an average of just over three minutes for each video. And, they were jumping in and out of video content rather than watching the video straight through.

For example, our "Wordpress: Getting Started" video saw peaks in traffic at 3 minutes 5 seconds, right as a title screen announced instructions on how to create a new blog. The video jumped from a 77% audience retention rate to 91% at 3 minutes 12 seconds, immediately following the title marker.

Break down lessons into smaller pieces

We dealt with this reality by strategically breaking down individual lessons into their smaller components. For example, in order to be able to edit video in FinalCutPro, students must first know how to set up projects and libraries, import video clips, fine tune clips, make edits on a timeline, work with audio, add transitions and finally export the video in a usable file. A video that touched on all of these components would run more than 15 minutes, even if it quickly highlighted each step. Instead, we created four separate videos, each less than 5 minutes long.

The individual videos address foundational knowledge broken down into incremental concepts for eventual use in creative and analytical applications. The video titles on YouTube help direct students to relevant materials for the steps they're working on.

The videos also lend themselves to "spaced learning" (Lang, 2016), or repetition of smaller concepts over various lessons. Research consistently demonstrates greater utility for student knowledge retention with "spaced learning" than "massed learning," typified by the traditional lecture-based presentation of information, where lots of details are introduced at once (Lang, 2016). The concepts and skills emphasized in the videos are repeated and reinforced though classroom exercises, and through that repeated exposure, become more deeply and durably embedded. The ability to re-watch portions of videos builds on this strength.

This should be the essence of a flipped classroom: the videos providing a directed knowledge base which can be accessed at the student's pace and recurrently dependent on the student's need. In our flipped classroom approach, in-class exercises using those same skills delineated in the videos help to enhance the practice of those skills and connect them to specific journalistic tasks. This can work well for online lessons, too, through the use of readings and follow-up assignments.

Consider cognitive overload

Our video design was informed by Richard E. Mayer's Cognitive Theory of Multimedia Learning, which summarizes how multimedia tools can improve learning. The theory focuses on how learners process information from visual and auditory modes simultaneously (Mayer, 2009). The theory borrows from Cognitive Load Theory's ideas on how much information can be processed at once, and still contribute to meaningful learning. (Sweller, et al, 1998).

Generally speaking, multiple modes of messages can be used at the same time to impart new information, but instructional designers should limit the amount and types of information for optimal learning. According to Mayer's empirical research, effective multimedia materials will have both visuals and narration, will highlight key information, will be segmented into short lessons, will allow user control and engagement with the lesson, and will avoid extraneous details (Rudolph, 2017).

Mayer's definition of multimedia includes printed materials as well as animated materials such as videos, as long as the material pairs visuals with words. For example, pairings can include auditory words with moving pictures, text words with printed graphics, or text words with moving pictures.

Our most recent study compared students who used video tutorials against students who used print tutorials, each designed using Mayer's guidelines for multimedia design. Students in both groups showed improvement after pre-tests, suggesting that well-designed tutorials in both formats can be effective.

Hold students accountable with quizzes

We had well-designed tutorials, but found in our initial run-through that students weren't watching the videos if given the choice.

In our first round of research, students were evaluated in four sections of the same course, each taught by a different professor. While all the sections used the

videos, only one of those professors quizzed students on the material immediately after it was assigned. It was this section that was found to have the greatest video viewership.

This finding dovetailed with current educational theory that espouses the use of short open-ended quizzes as a way of increasing information retrieval and especially long-term learning (Lang, 2016). In this way, it is essential to follow each video assignment with a quiz, which both holds the student accountable for the material presented and additionally gives the student the opportunity for the practice of retrieving that information which can be essential in the formation of knowledge (Willingham, 2009).

On our more recent round of testing students, all were quizzed after watching the videos. They still reported high levels of satisfaction with the videos. The students ranked the quality of the videos using a five point Likert scale — a one being "not helpful at all" to a five being "very helpful." Of students who had access to the videos during the semester, 87% of the respondents said they found the instructional videos either "helpful" or "very helpful" in terms of the "Content." Analogously, 89% and 88% of the students, respectively, reported "Ease of Use" and "Understanding" of the videos as either "helpful" or "very helpful." In "Quality" and "Length," they reported the videos being "helpful" or "very helpful" at a rate of 85% and 82%, respectively.

These perceptions were echoed by the respondents who had access to print tutorials during the semester, but who accessed the videos as a final study guide. The ratings from that group reported the videos as "helpful" or "very helpful" more than 80% of the time.

Be aware of upcoming trends

As the next generation of learners moves through the university, communication styles are evolving. The latest iteration of our research looks at these trends toward mobile video, and how they can be applied to the classroom tutorials.

College freshmen today were 8 or 9 years old in 2007 when the iPhone was introduced, leading to the current crop of journalism undergraduates as being not "digital natives," but more correctly, "mobile natives." As one result of that paradigm shift, news consumption habits have evolved. The most recent State of the News Media report published by Pew Research Center found 93 % of adults ever get news online (Mitchell, Holcomb, et al, 2016). Additionally, 50% of 18 to 29-year-olds get most of their news from online sources and 70% of that group use only mobile. (Mitchell, Gottfried, et al, 2016.) The findings are even more stark for 13- to 17-year-olds, where a recent study has shown 73% of Americans in that age group have a smartphone and among these "mobile natives," 94% go online at least once a day (Lenhart, 2015). Mobile devices accounted for 49% of all internet traffic in 2016 and video made up 73% of all the content being consumed, according to a recent Cisco forecast, which estimated that by 2021 a million minutes of videos will cross the internet every second (Cisco, 2017).

With the shift in platform comes a shift in format, as demonstrated by the various new digital storytelling forms in the news today. Of note is the evolution of online news video, in particular those published on social media outlets often viewed on mobile devices. While 75% of respondents to a Reuters Institute Survey said they rarely view news videos on traditional news websites, social media platforms such as Facebook are reporting more than 6 billion daily video views (Kalogeropoulos, et al, 2016). The Reuters Institute review found that 71% of social news videos had text overlay to make viewing without sound easier, and the average video length was 75 seconds. While the short length of the videos coincides with Mayer's design principle of segmentation, the text overlay seems to contradict his principle on redundancy.

Our future work seeks to empirically put to the test whether the evolution in news design might have some bearing on instructional design, in particular when it comes to text overlay.

Conclusion

In the context of using videos for flipping a class or bringing more material online, here are a few best practices.

1. Keep the videos short and specifically oriented toward the essential skills.

2. Segment the videos using large text block that can delineate the key concepts being taught.

3. Follow up with quizzes that get the students thinking about the concepts that were covered in the videos.

4. Integrate and reiterate the concepts and their use for journalistic practice within additional assignments.

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