HHS Public Access

Author manuscript

Med Teach. Author manuscript; available in PMC 2018 November 29.

Published in final edited form as:

Med Teach. 2017 August ; 39(8): 808–812. doi:10.1080/0142159X.2017.1322190.

12 Tips for Reducing Production Time and Increasing Long-Term Usability of Instructional Video

Marie K. Norman, PhD

Institute for Clinical Research Education, School of Medicine, University of Pittsburgh

Abstract

The use of instructional video is increasing across all disciplines and levels of education. Although video has a number of distinct advantages for course delivery and student learning, it can also be time-consuming and resource-intensive to produce, which imposes a burden on busy faculty. With video poised to play a larger role in medical education, we need strategies for streamlining video production and ensuring that the video we produce is of lasting value. This article draws on learning research and best practices in educational technology, along with the author's experience in online education and video production. It offers 12 practical tips for reducing the initial time investment in video production and creating video that can be reused long into the future. These tips can help faculty and departments create high-quality instructional video while using their time and resources more wisely.

Introduction

Video plays an increasingly prominent role in medical education (Dong & Goh 2015), and is a central component of online education, for which enrollments are growing faster than in any other educational sector (Allen & Seaman 2016).

When produced thoughtfully and used appropriately, video has the capacity to enhance student learning in powerful ways (Forbes et al. 2016). It has proven effective at grabbing student attention (Hartsell & Yuen 2006; Shephard 2003), increasing student motivation and self-reflection (Ljubojevic et al. 2014), fostering independence (Jarvis & Dickie 2010; Leijen et al. 2009), improving psychomotor clinical performance (Salyers 2007; Allen Moore & Smith 2012), and contributing to student satisfaction (Kelly et al. 2007). Researchers have found that video cases, in particular, allow students to create more realistic mental pictures of disorders, help them see patients as people, challenge them to elaborate cases with greater seriousness, and make content more memorable (de Leng et al. 2007).

Correspondence: Parkvale 307, 200 Meyran Avenue, Pittsburgh, PA 15213, USA, mkn17@pitt.edu, Phone: 412-864-3024, Fax: 412-586-9672.

Notes on Contributor:

MARIE KAMALA NORMAN, PhD, is Associate Professor of Medicine and Director of the Innovative Design for Education and Assessment (IDEA) Lab at the Institute for Clinical Research Education in the University of Pittsburgh's School of Medicine. She is co-author of the book, *How Learning Works: Seven Research-Based Principles for Smart Teaching* (Jossey-Bass, 2010).

Declaration of Interest

The author reports no conflicts of interest. The author alone is responsible for the content and writing of this article.

Video has additional advantages. The ability to rewind, rewatch, and fast forward allows students to set their own pace for learning, which facilitates both personalization and competency-based educational approaches (Dong & Goh 2015; Cook et al. 2008). Video makes it possible to move lecture-viewing – a relatively passive, individual pursuit – outside of class time, thus freeing up class time for interactivity and collaboration. Moreover, video captures instructional content in a reusable and repurposable format that can ultimately reduce the time faculty have to spend preparing and presenting the same material.

Despite these advantages, video poses a number of challenges. Producing high-quality video is expensive (Hansch et al. 2015) and requires a significant outlay of time, a resource that is in increasingly short supply among academic clinicians (Ward et al. 2012; Kelly et al. 2007; Sheffield et al. 1998). Moreover, video is a rigid medium, and hard to revise. Mistakes and revisions often require us to re-record video from the beginning, which can exact a second burdensome investment of time.

These challenging features of video deserve special consideration. If we want faculty to produce video or employ teaching modalities that rely on video, we need to find ways to help them do so more efficiently. Specifically, we need to offer strategies that reduce the initial time faculty must give to video production while increasing the longevity and reusability of the videos they produce, so that the investment of time and resources is worthwhile for all concerned. This article will begin to address that need.

Background

The term “instructional video” encompasses a wide variety of formats, sources, production styles, and use cases that, if conflated, can create confusion and confound evaluation. Instructional video can include recorded cases, tours, demonstrations, interviews, and lectures. Instructors can create videos themselves (sometimes with the help of university support centers) or use videos that they find on the Internet. They can use clips from television or feature films for teaching purposes, or even full-length documentaries or ethnographic films. Video can be recorded in a simple, low-cost manner, using a cell phone or webcam, or it can involve slick production with videographers and editors, multiple cameras, lighting, sets, and motion graphics – and everything in between. Video can also be used to different extents in different teaching modalities, ranging from light use of video in traditional, face-to-face teaching to intensive use of video in hybrid or online education.

Because it is not easy to simultaneously discuss such a broad range of video types, production levels, and uses, this article will focus on lecture video that instructors create themselves, on production levels that do not require large teams or exorbitant expenditures, and on the heavy use of video more typical of hybrid and online rather than traditional courses.

Research shows that one of the primary barriers to developing online courses is lack of faculty time (Allen & Seaman 2016; Brownell & Tanner 2012; Lloyd et al. 2012; Shea 2007). Thus, finding ways to reduce the initial time required to develop video is a step toward making hybrid and online teaching more feasible. At the same time, some investment

of time and energy upfront *is* necessary to create videos that can be reused over and over for many years, without the need for re-recording. In other words, while efficiency is important, so too is a "measure twice, cut once" approach to video production. The tips offered here attempt to balance the competing requirements of efficient initial production *and* long-term reusability.

It should be emphasized that this article focuses on improving the *efficiency* of video production and video reusability, not improving the pedagogical *effectiveness* of videos, as that issue has been discussed at length elsewhere (Dong & Goh 2015; Ljubojevic et al. 2014; Zhang et al. 2006; Hegeman 2015; Hsin & Cigas 2013; Merkt et al. 2011; Kay 2012; Schwan & Riempp 2004; Guo et al. 2014; Choi & Johnson 2005; Routt et al. 2015; Jarvis & Dickie 2010.) However, the recommendations provided here are consistent with the literature on video effectiveness and solidly grounded in the research on teaching, learning, and multimedia design (Ambrose et al. 2010; Mayer & Moreno 2003). In the absence of research targeting efficient video production specifically, these tips are drawn largely from my own and colleagues' experiences producing video for online and hybrid courses.

Tips for reducing production time and increasing the long-term reusability of videos

Tip 1: Use video strategically.—When putting a course online, it is tempting to believe that every hour of face-to-face lecture should be transferred to video. This is not an optimal strategy. For starters, there is a wealth of strong research evidence demonstrating that lecture, regardless of format, is not the best method for promoting deep learning or retention (Freeman et al. 2014). Perhaps most germane to the issue of efficiency, one should consider the time required to produce so much lecture. A better strategy is to leave the delivery of basic didactic content to readings while using video to provide the kind of framing, context, and synthesis that the instructor, as an expert and experienced professional, is uniquely positioned to provide. So, for example, rather than producing the world's 600th lecture on validity and reliability, consider using readings to provide definitions and concepts, while producing a short video that puts these readings into a larger context of professional significance.

Tip 2: Keep videos short.—Experts in online learning caution instructors against creating long videos (Mayer & Moreno 2003; Guo et al. 2014; Choi & Johnson 2005). Support for this advice comes from research on students' attention spans during traditional lecture (Bligh 2000), on data from Massive Open Online Courses or MOOCs (Guo et al. 2014), and from credit-bearing online courses (The State of Video 2015). While there is some disagreement among experts (Lagerstrom et al. 2015), most recommend that videos be 5 to 20 minutes in length. Keeping videos short is important from the standpoint of production efficiency as well as for student engagement and learning. Short videos are faster to record the first time *and* to re-record if updates are necessary.

Tip 3: Use existing videos.—Consider using videos that are already publicly available in place of videos you create yourself. For instance, instead of recording a video on critical thinking, you might use a YouTube video or TEDMED talk (http://www.tedmed.com/) that covers similar ground. In lieu of producing a video on the process of applying for an NIH

grant, you might use resources already available through NIH websites (https://grants.nih.gov/grants/how-to-apply-application-guide/video/index.htm), MEDtube (https://medtube.net/), or the growing archive of Open Educational Resources (OERs) (https://www.oercommons.org/). Bear in mind, though, that while finding existing videos does not take as much time as creating original videos, it does take time. One suggestion: ask your department to hire a graduate student with appropriate subject matter expertise to find, organize, and annotate a set of online videos the entire department can use – and also to check links periodically to make sure they are live.

Tip 4: Choose a production style to match the stability of the content.—Videos can be simple and home-made or highly produced. The style you choose should depend in part on the stability of the content. Is it material from a dynamic field that changes rapidly? Is it a new course that is likely to require refinement? If the answer to either question is yes, opt for a cheaper production style, even if it yields a less polished end product. A simple video shot on a smart phone can be surprisingly effective (Guo et al. 2014), as can videos recorded with free or inexpensive programs like Screencast-O-Matic (https://screencast-o-matic.com/), Jing (https://www.techsmith.com/jing.html), or Screenflow (https://www.telestream.net/screenflow/overview.htm). Why invest a lot of resources in video that you will have to re-record anyway? On the other hand, if the content is highly stable, involving conceptual material that does not change and an organization that has been honed over years of teaching, then investing time and resources into higher-quality production makes sense.

Tip 5: Script it out.—Writing out exactly what you want to say in your video entails more work up front than lecturing from notes or memory, and can, at first, seem less efficient. However, writing a script creates efficiencies at other stages of the video production process, expediting the initial recording by reducing stumbles and retakes while facilitating re-recording in the future. Scripts also serve as transcripts of your videos, which can be helpful for students with disabilities. There is a trick to delivering a scripted lecture, however, and that is to make the script lively and conversational, not formal and academic-sounding. Aim to write in short sentences, using accessible language and plenty of rhetorical questions. Also, practice delivering the script so that it sounds natural. If written and delivered well, a script need not sound scripted!

Tip 6: Develop a repeatable pattern.—It is helpful when planning instructional video to organize your content in a pattern that can be repeated across videos. For example, you might begin every video with the same greeting (e.g., Welcome back to Medical Writing!), pose an intriguing question, and tell students what they should be able to do by the end of the video (e.g., define X, compare X and Y, analyze Z). You might end every video with a recap of key points and a few questions for further exploration. Developing a repeatable pattern creates a more cohesive and predictable learning experience for students, which is especially important online where students have fewer environmental cues to provide structure than in a face-to-face environment. More importantly from the standpoint of efficiency, a repeatable pattern will provide you with a template for organizing your lecture material and help you write scripts more quickly.

Tip 7: Work in teams.—One strategy to save time in video production is to have groups of instructors design and build a course together, splitting the work of video production amongst themselves. In addition to reducing the total work, a collaborative approach to developing the curriculum can make the project more engaging for faculty. When multiple experts collaborate on the development of video content, moreover, the content tends to be more robust and less idiosyncratic than a single instructor's lecture material. This, in turn, makes it easier for a new instructor teaching the course to take over and use the videos created. Enlisting the help of instructional designers and video editors is, of course, another way to relieve the burden on faculty and create efficiencies in production. An instructional designer can redesign slides to be more visually engaging and pedagogically effective and edit scripts to be clearer, more concise, and more dynamic. A video editor can edit, organize, and post videos so faculty do not need to. There are many hidden stages of video production that can blindside faculty who have never done it before, so having a team to help share the work can save faculty time.

Tip 8: Invest in good visuals.—We have all been subjected to poorly designed slides with garish colors, mismatched fonts, too much text, and low-quality images. Bad visual design is not just hard on the eyes, it also impedes learning (Kalyuga et al. 2004; Mayer & Moreno 2003; Sweller 1988). Admittedly, creating good visuals takes time up front, but it is an investment that will ultimately decrease production time by extending the shelf life of your videos and reducing the need for re-recording. If you do not have the time or skills to improve your slides yourself, see if your department can enlist the help of an instructional designer or a student with strong graphic design skills. Small changes (e.g., the use of a clean, modern slide template, consistency in font size and color scheme, reduced text, and the addition of relevant images) can make an enormous difference, not only for student learning, but also for ensuring that the video looks clean and polished, and will hold up well over time.

Tip 9: Aim for modularity.—Good instructors build on what students already know (Ambrose et al. 2010), reminding students about relevant concepts from previous classes or alerting them to future content. In video, however, it is important to *avoid* references to earlier or upcoming material because it limits your ability to change the order of lectures or use your video in a new context. Let's say you create a video on construct validity for a course on biostatistics, then decide to use your video in a continuing education course on qualitative methods. If your video is filled with references to lectures the new group of students have not seen, it is likely to confuse them. Thus, it is best if each video you create stands more or less on its own. If you find that you must reference earlier material (and sometimes you must), keep your time references general. In other words, rather than say, "In our last lecture we discussed…," say, "Earlier we discussed…." This will give you more flexibility in how you sequence videos. You can reinforce connections between lectures outside of the videos, such as in the framing text in your learning management system (LMS). Text is far easier to change – and thus tailor to the immediate context – than video.

Tip 10: Avoid numbering your videos.—To keep your content organized, you may want to number your videos (e.g., Module 1, Lecture 2) as you are creating them, but avoid

using those numerical designations in the videos themselves. Like forward and backward references, numbering also limits your ability to reorder videos in the future. So rather than title a video, “Module 3, Video 2: Random Clinical Trials,” make it, “Random Clinical Trials.” Rather than starting your video by saying, “Welcome to Module 3, Video 2,” just say, “Welcome back!” You may even want to avoid using language like “module,” “session,” or “unit” in your recordings, in case you decide to change the terminology at a later date. We learned this the hard way when the faculty in our hybrid summer courses, unbeknownst to one another, all referred to the online course content using different terms. The inconsistency was confusing for students, and difficult to correct without re-recording the entire set of videos.

Tip 11: Beware of web links.—In face-to-face courses, faculty sometimes include web links in their slides to guide students to helpful resources. This is generally not a good idea in videos. If the link goes dead or the web material is changed or moved, the bad link will be hard to fix. In one video I saw recently, the instructor included a link to national mortality data in her slides and referred to specific tables and page numbers in her audio. The strategy was motivated by good teaching instincts – she wanted to connect what she was teaching to the real world and give her students the chance to interact with real data – but it was problematic for video. If that webpage is taken down or the data are updated, the page numbers referenced will change and students will not be able to follow. Generally, it is better to leave links out unless you know with certainty they will not change. You can still direct your students to helpful web-based resources; just try not to do it in video.

Tip 12: Omit references to particular assessments.—Students are especially attentive to lectures when they know the material is relevant to upcoming assessments. Consequently, it is tempting to reference or give advice about upcoming assignments or exams in lecture videos. Resist the temptation! If you change your course and remove or alter an assignment in the future, your video will refer to an assignment you no longer use, which will either confuse and alarm students or necessitate re-recording. Instead, give advice about assignments and exams in media other than video, for example during class meetings (virtual or face-to-face), in online discussion forums, or in announcements. You can also highlight connections between specific videos and upcoming assessments in your Learning Management System; for example, “This week’s videos are particularly relevant to your first project. Pay close attention to….”

Conclusions

Video – with its capacity to capture important visual information, facilitate self-paced learning, make lecture content accessible to remote students, and reduce the necessity for faculty of repeat performances – offers exciting new opportunities for educators. However, the time required for video production can impose a significant burden on busy, overworked faculty. Moreover, video has unique characteristics that make careful planning essential, lest we make mistakes in production that limit the long-term usability of the materials we create. With video poised to occupy a larger and larger role in education in the years ahead, it behooves us to develop and share better strategies for streamlining video production and ensuring that the video we produce is of lasting value.

Acknowledgements

The author would like to thank Drs Wishwa Kapoor, Doris Rubio, and Colleen Mayowski for their support and Natalie Vazquez for her collaboration on many video projects.

Funding

Research reported in this publication was supported by the National Center For Advancing Translational Sciences of the National Institutes of Health under Award Number UL1TR001857. The content is solely the responsibility of the author's and does not necessarily represent the official views of the National Institutes of Health.

References

Allen IE, Seaman J. 2016 Online report card: Tracking online education in the United States. Oakland (CA): Babson Survey Research Group. [Accessed 12 April 2017] Available from: https://onlinelearningconsortium.org/2015Survey.

Allen Moore W, Smith AR. 2012 Effects of video podcasting on psychomotor and cognitive performance, attitudes and study behavior of student physical therapists. Innov Educ Teach Int. 49:401–414.

Ambrose SA, Bridges MW, DiPietro M, Lovett MC, Norman MK. 2010 How Learning Works: Seven Research-Based Principles for Smart Teaching. San Francisco: Jossey-Bass.

Bligh DA. 2000 What's the use of lectures? San Francisco: Jossey-Bass.

Brownell SE, Tanner KD. 2012 Barriers to faculty pedagogical change: Lack of training, time, incentives, and…tensions with professional identity? CBE Life Sci Educ. 11:339–346. [PubMed: 23222828]

Choi HJ, Johnson SD. 2005 The effect of context-based video instruction on learning and motivation in online courses. Am J Distance Educ. 19:215–227.

Cook DA, Levinson AJ, Garside S, Dupras DM, Erwin PJ, Montori VM. 2008 Internet-based learning in the health professions: A meta-analysis. JAMA. 300:1181–1196. [PubMed: 18780847]

de Leng B, Dolmans D, van de Wiel M, Muijtjens A, van der Vleuten C. 2007 How video cases should be used as authentic stimuli in problem-based medical education. Med Educ. 41:181–188. [PubMed: 17269952]

Dong C, Goh PS. 2015 Twelve tips for the effective use of videos in medical education. Med Teach. 37:140–145. [PubMed: 25110154]

Forbes H, Oprescu FI, Downer T, Phillips NM, McTier L, Lord B, Barr N, Alla K, Bright P, Dayton J, et al. 2016 Use of videos to support teaching and learning of clinical skills in nursing education: A review. Nurse Educ Today. 42:53–56. [PubMed: 27237353]

Freeman S, Eddy SL, McDonough M, Smith MK, Okoroafor N, Jordt H, Wenderoth MP. 2014 Active learning increases student performance in science, engineering, and mathematics. Proc Natl Acad Sci U S A. 111:8410–8415. [PubMed: 24821756]

Guo PJ, Kim J, Rubin R. 2014 How video production affects student engagement: An empirical study of MOOC videos In: Sahami M, Fox A, Hearst MA, Chi MTH, editors. L@S 2014: proceedings of the first Association for Computing Machinery (ACM) conference on learning at scale; 2014 March 4–5; Atlanta. New York: ACM.

Hansch A, Hillers L, McConachie K, Newman C, Schmidt P, Schildhauer TS 2015 The role of video in online learning: Findings from the field and critical reflections. Alexander von Humboldt Institut Fur Internet und Gesellschaft.

Hartsell T, Yuen SC. 2006 Video streaming in online learning. AACE J. 14:31–43.

Hegeman JS. 2015 Using instructor-generated video lectures in online mathematics courses improves student learning. Online Learning. 19:70–87.

Hsin WJ, Cigas J. 2013 Short videos improve student learning in online education. J Comput Sciences Coll. 28:253–259.

Jarvis C, Dickie J. 2010 Podcasts in support of experiential field learning. J Geogr Higher Educ. 34 : 173–186.

Kalyuga S, Chandler P, Sweller J. 2004 When redundant on-screen text in multimedia technical instruction can interfere with learning. Hum Factors. 46:567–581. [PubMed: 15573552]

Kay RH. 2012 Exploring the use of video podcasts in education: A comprehensive review of the literature. Comput Human Behav. 28:820–831.

Kelly SP, Shapiro N, Woodruff M, Corrigan K, Sanchez LD, Wolfe RE. 2007 The effects of clinical workload on teaching in the emergency department. Acad Emerg Med. 14:526–531. [PubMed: 17483400]

Lagerstrom L, Johanes P, Ponsukcharoen U. 2015 The myth of the six minute rule: Student engagement with online videos. Paper presented at: Making Value for Society 122nd Annual Meeting of the American Society for Engineering Education (ASEE) Seattle, WA.

Leijen Ä, Lam I, Wildschut L, Robert-Jan Simons P, Admiraal W. 2009 Streaming video to enhance students' reflection in dance education. Comput Educ. 52:169–176.

Ljubojevic M, Vaskovic V, Sankovic S, Vaskovic J. 2014 Using supplementary video in multimedia instruction as a teaching tool to increase efficiency of learning and quality of experience. Int Rev Res Open Dis. 15:275–291.

Lloyd SA, Byrne MM, McCoy TS. 2012 Faculty-perceived barriers of online education. J Online Learn Teach. 8:1–12.

Mayer RE, Moreno R. 2003 Nine ways to reduce cognitive load in multimedia learning. Educ Psychol. 38:43–52.

Merkt M, Weigand S, Heier A, Schwan S. 2011 Learning with videos vs. learning with print: The role of interactive features. Learn Instr. 21:687–704.

Routt E, Mansouri Y, de Moll EH, Bernstein DM, Bernardo SG, Levitt J. 2015 Teaching the simple suture to medical students for long-term retention of skill. JAMA Dermatol. 151:761–765. [PubMed: 25785695]

Salyers VL. 2007 Teaching psychomotor skills to beginning nursing students using a web-enhanced approach: A quasi-experimental study. Int J Nurs Educ Scholarsh. 4:Article 11.

Schwan S, Riempp R. 2004 The cognitive benefits of interactive videos: learning to tie nautical knots. Learn Instr. 14:293–305.

Shea P 2007 Bridges and barriers to teaching online college courses: A study of experienced online faculty in thirty-six colleges. J Asynchronous Learn Netw. 11:73–128.

Sheffield JV, Wipf JE, Buchwald D. 1998 Work activities of clinician-educators. J Gen Intern Med. 13:406–409. [PubMed: 9669569]

Shephard K 2003 Questioning, promoting, and evaluating the use of streaming video to support student learning. Br J Educ Technol. 34:295–308.

The State of Video in Education: A Kaltura Report. 2015 New York: Kaltura, Inc. [Accessed 12 April 2017] Available from: https://corp.kaltura.com/content/download-copy-state-video-education-2015.

Sweller J 1988 Cognitive load during problem solving: Effects on learning. Cogn Sci. 12:257–285.

Ward NS, Read R, Afessa B, Kahn JM. 2012 Perceived effects of attending physician workload in academic medical intensive care units: A national survey of training program directors. Crit Care Med. 40:400–405. [PubMed: 22001582]

Zhang D, Zhou L, Briggs RO, Nunamaker JF. 2006 Instructional video in e-learning: Assessing the impact of interactive video on learning effectiveness. Information & Management. 43:15–27.