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# Open Educational Resources in the Time of COVID-19

## Two Case Studies of Open Video Design in the Remote Learning Environment

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Article abstract

The COVID-19 pandemic caused many post-secondary institutions to close abruptly in early 2020, and instructors were expected to transition to remote online instruction with little notice. For many instructors, hastily recorded lecture-capture videos alongside digital slides became the default mode of sharing instructional content. This sudden shift to video-based instruction was a significant challenge but also presented an opportunity to develop some instructional videos as open educational resources (OER). This paper outlines two case studies from the University of Saskatchewan in which a mix of OER and class-specific, closed-content videos were designed and integrated into remote learning environments. In designing these videos, we focused on technical design elements and accessibility, ability to reuse and share, and student engagement. Both cases, one in veterinary microbiology and the other in music research methods, followed similar strategies for creating multiple types of video content for the course, focusing on four distinct types (labs and demonstrations, guest interviews, lectures, and course information). Choosing to develop and share some of this video content as OER allowed us to expand the use of these learning objects beyond the online classroom. We discuss our considerations for making some videos open, including novelty of the content, reusability, copyright, privacy, and demands on instructor time. We also provide an introduction to our production process and practical tips, including planning, audiovisual production, editing, accessibility, and sharing platforms. The COVID-19 closures made 2020 an unexpectedly challenging year for students and instructors, but the necessity of moving instruction online prompted us to focus on supporting students in this new environment and helped us contribute to the growing body of OER.

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## TEACHING REFLECTION

# Open Educational Resources in the Time of COVID-19: Two Case Studies of Open Video Design in the Remote Learning Environment

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The COVID-19 pandemic caused many post-secondary institutions to close abruptly in early 2020, and instructors were expected to transition to remote online instruction with little notice. For many instructors, hastily recorded lecture-capture videos alongside digital slides became the default mode of sharing instructional content. This sudden shift to video-based instruction was a significant challenge but also presented an opportunity to develop some instructional videos as open educational resources (OER). This paper outlines two case studies from the University of Saskatchewan in which a mix of OER and class-specific, closed-content videos were designed and integrated into remote learning environments. In designing these videos, we focused on technical design elements and accessibility, ability to reuse and share, and student engagement. Both cases, one in veterinary microbiology and the other in music research methods, followed similar strategies for creating multiple types of video content for the course, focusing on four distinct types (labs and demonstrations, guest interviews, lectures, and course information). Choosing to develop and share some of this video content as OER allowed us to expand the use of these learning objects beyond the online classroom. We discuss our considerations for making some videos open, including novelty of the content, reusability, copyright, privacy, and demands on instructor time. We also provide an introduction to our production process and practical tips, including planning, audiovisual production, editing, accessibility, and sharing platforms. The COVID-19 closures made 2020 an unexpectedly challenging year for students and instructors, but the necessity of moving instruction online prompted us to focus on supporting students in this new environment and helped us contribute to the growing body of OER.

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**Keywords:** open educational resources; instructional video; online instruction; emergency remote teaching; COVID-19

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## Introduction

In March 2020, the COVID-19 pandemic forced many post-secondary institutions, including the University of Saskatchewan (USask),<sup>1</sup> to close abruptly and transition to remote online instruction (Fontaine 2020).

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<sup>1</sup> The University of Saskatchewan is a public medical doctoral university located in Saskatoon, Saskatchewan, Canada, on Treaty 6 territory and the traditional homeland of the Métis.

Instructors who were teaching in person were suddenly expected to move course content to online learning spaces with little preparation or training, a phenomenon known as “emergency remote teaching” (Adedoyin and Soykan 2020; Thurab-Nkhosi, Maharaj, and Ramadhar 2021). This shift required instructors to re-evaluate how courses were delivered, demanding creativity and new ways of looking at old content (Davis et al. 2020; Adedoyin and Soyez 2020, 8). In many cases, recorded lectures and live video became necessary stand-ins for in-person lectures and labs. This paper describes our experiences—as three colleagues working at USask with diverse instructional and technical roles who share an interest and engagement in OERs and online instructional strategies—developing video open educational resources (OER) for remote instruction in two separate courses at USask.

Joseph. E. Rubin teaches Veterinary Bacteriology and Mycology in the Department of Veterinary Microbiology, Carolyn Doi teaches Introduction to Library Research Methods for the Department of Music, and Shannon Lucky is an information technology librarian whose research focuses on making digital tools and resources accessible and usable. In 2020, Doi and Rubin began recording and editing videos for their online classes independently. Each consulted Lucky about the challenges they were having navigating technical options, design strategies, and planning for possibly having to teach online the following year as well. Despite teaching in different areas and starting this work independently, Doi and Rubin discovered, through Lucky, that they were using similar strategies in terms of designing, planning, and producing their videos. As a result, we began meeting in August 2020 as a group to strategize ways to make videos that were engaging for students and could be reused in other contexts.

We viewed the necessary changes to our pedagogy through the lens of innovation and problem solving; this helped us maintain a positive outlook throughout a difficult time and project creativity and optimism rather than frustration to our students. Developing a significant amount of high-quality digital content over a short time period helped us realize the value of sharing some of our video content as OER. By remaining mindful of the legacy of the content we were building, it was possible to re-frame our proximate challenges into an investment in our future teaching instead of a singularly difficult experience. We focused on ways to design reusable, remixable, concise, and modular videos that could be shared with students and colleagues as OER, generating a rich collection of digital content that will enhance our future teaching (online and in person). Making these resources available to other instructors has also helped broaden the impact of our work and, in some instances, avoided the need to duplicate teaching efforts within our institution.

In this teaching reflection, we will first briefly discuss the uses of video as a learning tool, then provide an overview of the benefits and challenges of using OER in post-secondary institutions. The two case studies detail how our syllabi changed in response to the shift to remote learning (including examples of the teaching materials we used) and how our students responded.<sup>2</sup> We also discuss the experience we had producing videos and OER prior to the pandemic and how this experience shaped our course content design and use of OER. In the Discussion and Recommendations section, we detail the factors that contributed to making some videos OER and offer the most helpful technical tips we learned for developing high-quality video content that is both more engaging for our students and more likely to be reusable in the future. This section is followed by considerations for sharing and discoverability that discuss ways to make OER video content accessible for reuse, which may be applicable to other post-secondary instructors who are considering developing their own instructional videos with a mind to sustainability and shareability.

## Literature Review

### Online Instruction in the Age of COVID-19

Among the many challenges posed by the sudden transition to online teaching was determining the format of course delivery: synchronous, asynchronous, or a combination of the two. A major problem reported by students during this time was network issues during synchronous video lectures, particularly for students living in remote areas, where internet connections are frequently less stable and could have also been affected by the “exponential rise in network usage due to COVID-19” (Ahmed, Altaf-ur-Rehman, and Ikram Khan 2020, 12).<sup>3</sup> Asynchronous video presented a positive alternative for many, in that videos can be streamed or downloaded and watched in ways that are less reliant on strong internet connectivity (Ahmed, Altaf-ur-Rehman, and Ikram Khan 2020, 12). According to Ahmed, Altaf-ur-Rehman, and Ikram Khan (2020,

<sup>2</sup> The use of student feedback in this paper was deemed exempt from research ethics review by the Behavioural Research Ethics Board at the University of Saskatchewan because the data was collected anonymously.

<sup>3</sup> Technical challenges were not the only issue faced by post-secondary students during this time. Murphy, Eduljee, and Croteau (2020) report on some of the negative emotions students experienced during the transition to virtual classes, including uncertainty, anxiety, and nervousness. Adedoyin and Soykan (2020) identify poor internet connectivity, inequalities for students from varying socioeconomic backgrounds, frequent interruptions, student understanding of digital learning tools, and increasing workload and time in online environments as challenges.

9–11), teachers used several strategies to engage students in both synchronous and asynchronous online classes during the COVID-19 pandemic, including modifying lectures by “cutting content into chunks,” incorporating more online activities, trying the flipped classroom methodology, and “implementing the concept of ‘self-learning.’” In the USask context, institutional recommendations to deliver course content asynchronously and to “chunk” lecture videos provided a roadmap for instructors like ourselves to avoid problems in remote delivery.

### **Video as a Learning Tool**

While we developed many of the video resources described in this reflection out of necessity, the literature shows that video can also contribute to positive learning outcomes. As a form of multimedia learning, video offers a variety of stimuli through visual and aural channels and serves as a multilayered instructional tool that is closer to an in-person lecture than singular forms of instruction such as readings or podcasts (Mayer 2008; Noetel et al. 2021; Rolfe and Gray 2011). Mayer explains that “people learn more deeply from words and pictures than from words alone” (2008, 31), both of which are delivered in video learning objects. In a systematic review of the use of video in higher education, findings showed that online learning can be “as good, and sometimes better, than face-to-face teaching” and that videos in particular led on average to “better learning outcomes compared with other methods” (Noetel et al. 2021, 221). Noetel et al. suggest that video may be used with such success, regardless of discipline, because: 1) students are able to manage the pacing and timing of the learning; 2) instructors can better optimize the video through editing, making it more coherent and incorporating design principles such as timing and highlighting key points and; 3) video offers a more authentic perspective, especially when teaching skills, since it provides a realistic demonstration given through the eyes of the performer (2021, 222–3). Yet, while the use of instructional video has these benefits, the use of video alone is not a quality pedagogical approach, and it should be used in combination with “dynamic student-student and student-teacher interactions” (Noetel et al. 2021, 223). These ideas informed our decision-making in developing instructional videos for our courses and the choice to share some of our videos as OER.

### **Open Educational Resources**

The term open educational resources (OER) was first used at the UNESCO 2002 Forum on the Impact of Open Courseware for Higher Education in Developing Countries (UNESCO 2002 as cited in Otto 2021) and, despite the many definitions that exist in the literature, we embrace the most recent UNESCO definition of OER as “learning, teaching and research materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, reuse, re-purpose, adaptation and redistribution by others” (UNESCO 2019, 3f). While open textbooks are perhaps the best-known example of OER used in post-secondary institutions, all pedagogical tools can be developed as open resources, including “full courses, materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge” (William and Flora Hewlett Foundation n.d.).

The benefits of open pedagogy, such as supporting new modes of scholarly communication by allowing students to have an active role in developing and improving resources, are commonly linked to the use of OER (Lashley, Wesolek, and Langley 2018, 2). However, as Otto (2021) argues, the link between OER and open pedagogy is not direct; OER are often grouped with other open concepts (namely open education and open pedagogy), but OER are content, not an educational model or practice (Mengual-Andrés and Payá-Rico 2018). Open pedagogy requires a significant shift for instructors and students that introducing the use of OER in an otherwise unchanged course does not. Therefore, rather than open pedagogy, our approach embraces Wiley and Hilton’s (2018) “OER-enabled pedagogy,” which describes teaching and learning made possible by use of the 5R permissions articulated by David Wiley (n.d.)—which allow users to retain, revise, remix, reuse, and redistribute content that has an open license or is in the public domain— that are widely adopted as OER criteria.

OER benefit students, instructors, and their institutions by helping to broaden access to education, reducing the cost of materials, and improving the overall quality of teaching (Otto 2021). Perhaps the most widespread argument for OER adoption is financial savings for students who do not need to purchase expensive course materials. In addition, the ability to download OER in multiple formats, and to different devices, makes these resources accessible to more students on their preferred platforms (Tillinghast 2020), which ensures that all students have access to the course materials for the duration of the class and beyond, supporting student success and retention (Ross, Hendricks, and Mowat 2018; Colvard, Watson, and Park 2018; Clinton 2018; Fischer et al. 2015). OER use is associated with significantly lower withdrawal rates, a claim substantiated in Clinton and Khan’s (2019) meta-analysis of eleven studies of postsecondary courses that

used OER compared to those that used commercial textbooks. They found that OER courses had a 29 per cent lower withdrawal rate than those that used commercial textbooks.

For instructors, using multimedia OER like video can support student engagement, diverse learning styles, and accessibility. Compiling and creating OER can produce learning materials that are better suited to instructors' courses and are as good as, or better than, mass-market textbooks. Digital OER can also be quickly updated or corrected when changes are needed—a significant advantage over print textbooks. Developing new or modifying existing OER supports pedagogical freedom (Dermody 2019) and allows instructors to have control over their content (Tillinghast 2020).

Beyond the instructor's own classroom, OER benefit learners and other instructors by being accessible and open to use for a wide range of purposes: training students and research staff in particular methods or techniques; providing in-depth answers to common questions from students; sharing instructional materials with colleagues; and serving as demonstrations in presentations or other knowledge mobilization activities. This broad reach can also benefit the reputation of the OER creator and their home institution by demonstrating both a commitment to accessible education and potentially attracting prospective students (Stacey 2012). Instructors benefit when they receive recognition—through, for example, statistics detailing how frequently the resources were used by students and reused at other institutions—for the content they share and contribute to the broader educational discourse (OECD 2007; Tillinghast 2020).

Developing and using OER are not without challenges. There is a time cost for instructors who use OER as the primary instructional materials in their courses (Browne et al. 2010; Towey et al. 2019). Creating entirely new material or adapting existing OER takes time and energy and may require the instructor to find replacements for ancillary content like test banks or slide decks. Furthermore, a common criticism is that it is harder to ensure quality because anyone can create and share OER with an open license, and it is up to the end-user to assess its usefulness (Hodgkinson-Williams 2010; Koseoglu and Bozkurt 2018; Wang and Towey 2017). However, the counterpoint is that commercial print textbooks can rapidly become outdated, and relying on publishers to determine quality and appropriateness presents its own problems.

At USask, there are supports for OER development available through the Gwenna Moss Centre for Teaching and Learning (GMCTL) (Ross, Lucky, and Francis 2018; University of Saskatchewan n.d.a.) and a growing community of open educational practices proponents. The financial and technical support for OER on our campus has historically focused on open textbooks and ancillary materials such as test banks but has more recently expanded to include training for instructors. USask does not currently provide an institutional OER repository for storing and sharing OER video materials, although it does have an open publishing platform for open textbooks (University of Saskatchewan n.d.b).

## Case Studies

To support remote teaching at USask, instructors were encouraged to use the institutionally supported Panopto content management system (CMS) for hosting and sharing instructional videos and the Canvas learning management system (LMS) for all course content and communications. The cases discussed here (VTMC 347: Veterinary Bacteriology and Mycology, taught by Rubin; MUS 180: Introduction to Library Research Methods, taught by Doi) highlight two examples of remote teaching using video as learning objects. We present an introduction to each course, the types of videos that were developed, considerations for how the videos were created, and the rationale for producing some videos as OER.

### Veterinary Bacteriology and Mycology (VTMC 347)

Veterinary Bacteriology and Mycology (VTMC 347) is a core course taught in the second year of the undergraduate Doctor of Veterinary Medicine curriculum. In the first two years of this program, each course is offered once annually, and students enroll as cohorts of seventy-eight to eighty-five students. This three-credit course consists of forty-one hours of lecture and four laboratory sessions. The objective of this course is to provide students with a background in the biology of bacteria and fungi, which cause infections in animals; a foundational knowledge of anti-infective pharmacology; and an understanding of how a veterinarian can successfully collect and submit samples to a lab for analysis. As this course moved online in fall (September to December) 2020, institutional recommendations to teach exclusively asynchronously, combined with a heavy load (5.2 hours/day average) of scheduled content for the students, had me concerned about their ability to remain engaged and focused.

Prior to 2020, I had not created videos as part of my teaching methodology. However, I have always included audiovisual elements in lecture materials where possible; in class I frequently play YouTube videos depicting key concepts (e.g., how animals with a particular infection present clinically, information about foreign animal diseases not present in Canada, or news stories relevant to class). Furthermore, veterinary microbiology is a niche sub-discipline within clinical microbiology and, when I was initially compiling



instructional materials to teach this course in 2016, I found large holes in the availability of open-access visual and multimedia content. The paucity of high-quality images of microbes of importance to veterinary medicine, both culture plates demonstrating colony morphology and microscopic images, was a major gap that led me to create my own content *de novo*. In producing this content, I made the decision to leverage this personal project to compile an open-access library of images for other instructors to use. To date, a total of seventy-six images have been uploaded under a CC BY-NA-SA 2.0 license to a Flickr account I created for my research lab (Rubin n.d.b). Collectively, these pictures have been viewed more than fifty thousand times and have been included in courses at other institutions. Because this course has no required textbooks or other student-purchased materials, the incremental benefit of developing OERs was primarily for my community of educators rather than the financial advantage of learners.

In the fall of 2020, this course was organized into modules for each lecture, assignment, and the virtual laboratory, which included links to video segments, PDFs of lecture PowerPoint presentations, assignment sheets, explanatory videos, grading rubrics, due dates, and submission instructions. A variety of videos were recorded for this course. First, I used a welcome video to explain the structure of the course and to express empathy for the difficulty of learning remotely, specifically expressing how instructors and students alike were exploring a new way of interacting together. I took the students on a “digital field trip” of the laboratory space where they would normally work, as well as my own research lab, where some experiments for the course were carried out. Throughout the course, I also created videos to address student questions; this approach was faster than providing individual email responses, and making the videos available asynchronously in the LMS had the added benefit of allowing all students to access the information. In two instances, I conducted in-depth interviews (twenty to forty minutes) with experts over Zoom in response to student questions where I lacked topic expertise. Questions were pre-planned, but the tone was conversational, requiring little planning for both myself and the interviewee. Recording the forty hours of lecture which I normally deliver was the most time-consuming part of moving the courses online. I recorded myself delivering each lecture in a single take using the share screen function within Zoom. The lecture was then broken into shorter seven-to-twelve-minute chapters in the editing process, which was done using iMovie (Rubin 2020b).

Finally, because all laboratory sessions scheduled for this course were moved online, it was critical to have clear, high-quality video demonstrations to convey hands-on concepts (Rubin 2020a). The lab demonstration videos were generally shorter than lecture videos but demanded a higher degree of planning, production, and editing. I compiled a list of all the laboratory techniques taught in the course and prepared storyboards for each video to ensure that all critical steps of each method were documented. Each set of demonstrations was set up in the laboratory and filmed, capturing both close-up and long-shot footage, which I compiled and edited in iMovie. Audio recorded at the time of the video capture was removed and replaced with voiceovers during editing to ensure the highest quality audio possible. The techniques demonstrated are foundational clinical microbiological methods of interest beyond the veterinary realm, and so this content was made freely available with a CC-BY license on my YouTube channel (Rubin n.d.a).

Prior to the pandemic, student assessment in this course was heavily weighted towards examinations. To alleviate student stress, I increased the grade weight of labs and added a Wikipedia writing assignment and a multiple-choice question writing assignment to reduce the overall proportion of high-stakes assessment in the final grade. For the Wikipedia writing assignment, students wrote or improved articles on materials relevant to the course, which were ultimately published on Wikipedia. Engaging students in the production of open resources challenged them to develop their research and communication skills, gave life to their assignments as resources beyond the classroom, and exposed them to the world of open resources from a new perspective (Rubin 2021).

Throughout my emergency transition to remote teaching, my primary focus was on course delivery rather than comparing teaching effectiveness with previous in-person methods; as such, I did not systematically measure student perceptions of their experience. However, a general theme of my teaching reviews revealed that the students greatly appreciated how the course was delivered and found the videos engaging and easy to watch. Furthermore, I was awarded the “Excellence in Online Teaching Award,” presented by the Western College of Veterinary Medicine, after being nominated by the second-year veterinary students. Moving forward, the portfolio of materials I developed to teach this course online has already been a tremendous resource. In the 2021–22 academic year, I am teaching this course in person, and I have provided my students with the laboratory demonstration videos as a pre-lab exercise. Instructors have also utilized these videos at other institutions. Through YouTube analytics, I can see that there have been more than seven thousand views, including those originating from other academic institutions and various academic LMS such as BlackBoard, Brightspace, and Google Classroom. I have also re-used last year’s lecture videos, uploading them to the LMS for students self-isolating or otherwise unable to attend in-person lectures.

### Introduction to Library Research Methods (MUS 180)

Introduction to Library Research Methods is a first-year required course for undergraduate music students in the College of Arts & Science. The class size is small; typically, registration sits at ten to twenty students per term. Until fall semester 2020, the course was delivered using the flipped classroom methodology: seven hours of in-class instruction over the course of a semester and hands-on learning activities, with required online videos and quizzes to be completed in advance of each class (Doi 2016, 114–5). Beginning in fall 2020, the course was offered remotely in an asynchronous format. Given the challenges related to remote learning, I organized the MUS 180 course to minimize the stress associated with the online learning environment. I pared down learning content to the most essential information and, to make up for lost face-to-face time, I provided several videos addressing course expectations and assignment walk-throughs as well as planned a one-on-one check-in meeting with each student to go over any questions or concerns related to Canvas, course objectives and expectations, and upcoming deadlines.

Ultimately, the seven weeks of the course were restructured into seven online modules, which included new video recordings of the lectures and hands-on learning activities alongside other open videos and course readings. Each module aims to cover a different learning outcome from the course syllabus (Doi 2021c), which students can work through linearly, and focuses on aspects of library research (searching, evaluation, writing) and music research source types (literature, music scores, reference sources, sound recordings, and primary sources). Each module is laid out to include an introduction to the learning objective, a series of learning objects (in the form of readings, videos, and podcasts), and assessments. The course had previously included some online videos as part of the flipped classroom methodology. However, more were incorporated after the course moved online in 2020 to make up for the lost classroom time.

I developed all the videos for MUS 180, including course-specific content, lectures, conversations with guest experts, and demonstrations of research tools and processes. The work process for creating the videos required varying amounts of time depending on the type of video. Demonstrations of course concepts using library databases, images, and sounds were the most time-consuming to make because they required scripts, pre-planned slides, and examples. For these videos, using the highest image quality when recording was critical so that students could clearly see search demonstrations using library databases and catalogues. To make these videos as legible as possible, a high-resolution image of each PowerPoint slide was edited into the video to ensure readability because screen capture lowered the resolution of slides. I purchased some software and equipment to make these videos, including a Blue Yeti microphone for audio capture, Snagit image and screen capture software for screen recordings, iMovie for video editing, and the Apple Preview app to convert slides to high-resolution JPEG format. The videos incorporated background music sourced with permission from a local musician, which played during the introduction, chapter breaks, and credits of each video (respectfulchild n.d.).

Some videos created for MUS 180 were shared openly on YouTube, while others were shared on Panopto. To ensure that videos were copyright compliant, the images and music used are my own photographs, copyright-free, or used with permission of the creator. Videos featuring a guest speaker were shared only with the guest's permission. Videos were shared on YouTube with a CC-BY license when they contained no identifying information about the course itself (i.e., reference to the course section or enrollment) and were deemed useful beyond the classroom or for a future iteration of the same course, such as: short introductions to specific research strategies, tools, or techniques; step-by-step guides to searching; and conversations with guests about aspects of the research process. I found that YouTube provides an easy-to-use interface that my students know and understand, with some added features that give me insight into how frequently the videos are being viewed and where viewers are located. While it is not a dedicated OER repository, YouTube is nonetheless one of the predominant platforms for instructional video, regardless of discipline.

With the sudden switch to online-only delivery, it was important to me to get student feedback on the design of the course and to identify their learning needs, especially with relation to how to receive and access course learning materials. At the beginning of each semester (fall 2020, winter 2021, and fall 2021), I polled students to find out what challenges they identified for themselves (e.g., access to technology, preferred learning styles) and to ask how they preferred to learn new information. The response rate for all three surveys (Table 1) was 92 percent (twenty-three of a possible twenty-five respondents). In response to the question "Which methods do you prefer when learning new information? (check all that apply)," 78 percent of students who responded indicated a preference for video tutorials or lectures, the highest of the learning methods offered.

When I issued the same survey at the end of the course in fall 2020, winter 2021, and fall 2021, the response rate was 58 percent (eleven of a possible nineteen respondents), and students indicated that their preference for video tutorials and video lectures had increased, with 91 percent of students ( $n = 11$ ) selecting this delivery method as their learning preference.

**Table 1:** Students' preferred learning methods at the beginning of fall 2020, winter 2021, and fall 2021 semesters

Learning method	Number of student responses ( <i>N</i> = 23)	% of total
Video tutorial or video lecture	18	78%
Getting hands on experience (e.g., labs, practice questions, etc.)	15	65%
Reading an article or text	11	48%
Listening to a podcast or audio instructions	10	43%
Reading and participating in an online discussion or chat thread	7	30%

Most videos that I developed for the fall 2020 iteration of the course were reused in winter 2021 and fall 2021. I have also shared these videos beyond this particular course: in other music courses and in an online music research guide for broader use as needed for library research support (Doi n.d.).

## Discussion and Recommendations

### Prioritizing Content for OER Creation

We share in this section our criteria for determining what materials to develop as OER. While some materials were made open in MUS 180 and VTMC 347, others were only available to enrolled students through the LMS. Table 2 lists the types of video content that we created for our courses in order from highest priority to share as OER to lowest priority. Technical considerations for each type of video are described, along with a rationalization for OER prioritization. Deciding what materials to develop as OER is based on five factors, which we offer as considerations for others planning to create OER:

1. *Novelty and Uniqueness*: Content that fills a gap in available resources in our disciplines. Before developing video content as OER, instructors should consider its usefulness in terms of its uniqueness and usability in the wider landscape of educational videos. In some cases, the video you want to make may have already been created and shared on an open platform. A significant benefit of OER is eliminating duplication by making standard curricular content available to be adapted for multiple contexts (Hoosen and Butcher 2009). Our scholarly and pedagogical communities are strengthened when OER are shared, reused, remixed, and cited in different contexts. Do some preliminary homework to ensure that your planned video content fills a gap and provides a unique perspective. This allows you to see what content would be most useful to share and provides insight into what other instructors and students find when they search for materials online. You may discover something you can adapt or incorporate into your course to save you time and resources.
2. *Reusability*: Content that will be appropriate and relevant to use again in our teaching without requiring significant changes or updates and that is relevant to learners and instructors in a wide range of contexts.
3. *Privacy*: Content containing neither student-identifying information nor confidential teaching materials (e.g., patient records from the Western College of Veterinary Medicine). Any videos containing private information cannot be shared externally and cannot be used in OER. In our courses, these materials were shared only with enrolled students through the LMS, and videos that could identify students were not reused in other course sections.
4. *Time*: Preparing OER can be labour-intensive (e.g., removing copyrighted content, capturing and editing high-quality videos, composing annotations and descriptions, etc.), and it was impossible for us to make all course content open. Prioritize the content that is best suited to OER.
5. *Copyright*: In classrooms, a wide variety of materials (images or figures from published sources) can be included in course notes/lectures under fair dealing provisions of Canadian copyright law; however, sharing this content outside the classroom may not be permitted. Uncertainty surrounding legality and intellectual property rights (Kursun, Cagiltay, and Can 2014) and the possibility that being unable to use copyrighted materials would reduce the quality of course materials (Lee et al. 2008) led to our decision to make some videos open and others limited to our students. Videos that used copyrighted materials, like figures from commercial textbooks or copyrighted images, were automatically eliminated as OER options.



**Table 2:** Types of video content created for MUS 180 and VTMC 347, in order from highest priority to share as OER to lowest priority

Video type	Example(s)	Purpose	Technical considerations	Priority to publish as OER
Labs & demos	Wet lab or hands-on demonstrations. Screencast of <i>in silico</i> application. Screen captures of online demonstrations (e.g., search techniques, writing strategies, etc.). Examples: Broth Microdilution Testing (Rubin 2020a); How to Find Music Scores in the Library (Doi 2021b)	Demonstrating critical methods or approaches. Replacement for labs/practicums/hands-on practice.	Detailed video plan, script, or storyboarding may be helpful. Multiple people may be required (one to demonstrate, one to shoot). May want to include high-resolution screenshots or images edited into video. Use a video editor (e.g., iMovie) to incorporate images, video, and sound where appropriate.	<i>High.</i> Videos often contain bite-sized pieces of information that work well in various learning environments and are not uniquely applicable to an individual course/class.
Guest interviews	Conversations with outside experts or guest presentations/ lectures. Example: Advice on Using Music Scores for Research & Study (Doi 2021a)	Adding expert perspective to course content. Adding a more interactive or conversational tone to course content.	Record meeting in a video conferencing platform (e.g., Zoom, WebEx, Google Hangouts, etc.) Consider preparing questions or topics to discuss. Minimal editing required.	<i>Medium.</i> Consider sharing as a podcast if the visuals are not necessary. Ensure permission has been granted by your guest(s) to share any recorded conversation.
Lectures	Recorded lectures. Example: Introduction to Music Reference Sources (Doi 2021d)	Replacement for didactic sessions.	Check with your institutional best practices (e.g., asynchronous vs. synchronous delivery). May want to prepare speaking notes or script. Prepare an accompanying digital slide presentation. Record both slides and video using a video conferencing platform (e.g., Zoom, WebEx, etc.) or video capture program (e.g., SnagIt, Camtasia, etc.). Check usage rights for any embedded images within slides. Include citations for all references, images, sound used.	<i>Medium.</i> Varying priority depending on use of copyrighted or private materials within lectures.
Course information & FAQs	Welcome videos, information about assignments, virtual tours, responses to student questions.	Familiarization with course expectations (e.g., due dates, grading rubrics, etc.), and getting to know course instructors. Addressing student questions on course content or structure.	Simple talking-head video. Informal narrative style presentation is usually adequate. Virtual tour may require planning to capture shots of physical spaces. Consider providing links to any documents referenced in the video (assignments, rubrics, etc.). Minimal editing required.	<i>Low.</i> Content is course specific.

## Practical Considerations for Video OER Creation

The “emergency remote teaching” pivot presented us with a two-fold challenge: a steep learning curve with limited time to create new video content and a responsibility for this content to engage our students, who were suddenly spending hours every day in online classes. Campus teaching supports, overwhelmed by the need to support all teaching faculty moving online at once, were necessarily focused on getting everyone connected at the most basic level. Many of the resources provided by our institution were either basic technical training for software or navigating the LMS, while practical, easily applied “on-the-ground” advice for creating engaging, high-quality video content was missing. We wanted to make our courses as compelling and useful as possible, so we turned to outside sources, including peers in discipline-specific societies and associations (e.g., the Canadian Society of Microbiologists Committee for Microbiology Education [2020], the Canadian Association of Music Libraries), colleagues from outside institutions who specialize in remote content delivery (e.g., instructors from Athabasca University), and instruction literature, for guidance.

Most of our students are accustomed to watching well-produced, entertaining online video content in their free time. While the goals of educators and YouTube/TikTok influencers are different, we can learn from these content creators, who draw large online audiences using the same tools available to us. Many of these popular creators are open about their strategies to create successful YouTube channels (PewDiePie 2017; Cruz 2018; Abdaal 2021), and there are elements of their advice that work well for instructional videos. Our key takeaways include:

- Make yourself stand out. For video lectures, this could mean striving to create a consistent brand as an instructor (e.g., injecting personality or humour into videos).
- Use consistent, unique visuals and music/audio. Consider developing a standard intro sequence, chapter breaks, and end screen for your lectures.
- Make your audience care about you as a creator, not only the content you create. A personal connection is important for teaching, whether in person or online (e.g., sharing a personal anecdote, hobby, or interest).

### Technical Tips

The amount of technical information available online relating to video and audio design and production can be overwhelming. However, the pressure to become proficient with video capture and editing in such a short time frame can lead to poorly executed, low-quality videos. It is beyond the scope of this paper to give step-by-step advice on all technical aspects of video creation, but we do want to share the most valuable things we learned to create open instructional videos that will give high-quality results with minimal financial investment.

#### Audio

Audio is the most critical aspect of lecture or conversational videos and one of the easiest ways to boost video quality (Costa 2020, 96–97).

- Strive for clear audio with minimal background noise. Consider using an external microphone when recording, whether it is a headset or a professional condenser mic.
- Select background music or sound effects to make videos stand out (e.g., making a polished introduction, adding relevant sound clips, or relying on consistent audio cues).
- Emote and enunciate clearly. It is surprisingly challenging to convey subject matter with passion in an asynchronous environment. Unlike in-person teaching, enthusiasm is more difficult to convey in a recording and otherwise normal delivery feels flat. When recording, enhance your standard level of energy and delivery style. This enhanced expression can be draining to maintain for long recording sessions; it is helpful to pace yourself.
- Be warm and conversational in your delivery. Enlisting someone to talk to while recording can make your on-camera delivery more relaxed and natural. Alternatively, you can record an interview or conversation with another person to introduce another voice and perspective and make the content more engaging.

#### Visuals

The importance of visual quality will vary depending on the type of content you are producing.

- When recording screen captures or images like presentation slides for videos, make sure that these images are sharp and easy to read (if the slides are accompanied by a small video of the presenter, the quality of that video may be less critical). Demonstrations or labs requiring students to learn a technical skill at home should be captured at high resolution.

- When recording websites or software demonstrations, set the full-screen option to ensure a higher resolution (1080p60 HD is optimal for demonstration and lab videos). Adding in high-resolution images of slides in place of simply screen sharing the slides will also ensure clearer visuals when exporting your video. When recording yourself speaking, consider camera position, lighting, background, and personal appearance.
- Position the camera level with your face to ensure that you are looking directly into the lens (and therefore at your audience). This positioning will also help avoid unfavourable angles while minimizing muscle strain (Costa 2020, 95–96).
- For the most flattering lighting, try to record in a place with natural light, such as facing a window. Avoid placing bright lights behind you or sitting directly below harsh overhead lights (NigelBarros 2019).
- Your background can help you stand out and convey approachability. A simple, solid background wall colour reduces distraction, but make sure you are not wearing the same colour when you record. Having some personal items (e.g., a piece of art, bookshelf) behind you can help to humanize you as a presenter.
- Your appearance will express your personality. The goal is to balance personality with professionalism. Remember that if you are planning to make your videos open, they may be reused in any number of contexts.

### Editing

Editing can improve video quality by giving the instructor the option to condense content, add visual and audio clips, and improve the flow of the presentation, but you do not need to have professional-level production quality. To balance the desire for quality with available time and resources, some instructors record narration for individual slides as discrete short clips or edit out errors using software.

- Editing tools and techniques can be used to seamlessly splice additional content into your videos, including other video clips, annotations, and captions to improve accessibility.
- You can also add missed content or correct a slip-up without needing to re-record the entire video. For example, if you are working on a lengthy lecture and you make a mistake while recording, it is faster to keep recording but pause and then repeat the correct content to give yourself space to cut that mistake out in the final edit.
- You may want to add in captions or text if small but key pieces of information were omitted in the recording process.

A summary of this editing pipeline can be found on Rubin's lab YouTube channel (Rubin 2020b).

### Accessibility

Incorporating accessibility into the design of instructional videos benefits everyone. Using inclusive or universal design principles<sup>4</sup> helps to create OER that work for the broadest range of potential users. However, if you are unfamiliar with these methods and are under a tight deadline, as we found ourselves, a simple and impactful starting place is adding video captions. Captions are increasingly popular for all audiences because they make videos more accessible in loud environments or quiet spaces where playing audio would be disruptive (AEM Center n.d.).

- YouTube has a tool that automatically creates subtitles (transcription of the dialogue), but captions can also include other relevant information, including descriptions of music or sound, to communicate the same level of information as the audio.
- Adding a transcript (text version of your audio, not synchronized with the video) is also helpful for learners using screen reader software.
- Inclusion of both captions and a transcript, as well as audio description for people with visual disabilities, improves accessibility further (Queen's University n.d.). Audio description can be more difficult to add yourself, but you can preclude the need for it by making sure the narration clearly describes all visual information (Davis 2018).

### Considerations for Sharing and Discoverability

Where and how to share these videos can take many forms. In our cases, discoverability was improved by uploading the OER videos to YouTube with a CC-BY license. However, it should be noted that this sharing

<sup>4</sup> Defined by the Centre for Excellence in Universal Design as "the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability" (National Disability Association 2020).

platform does have significant limitations for reuse and remixing because it does not have an option to download videos to edit or use off the platform. One simple thing a video owner can do is include text in the YouTube video description to indicate that they are willing to share a downloadable, editable copy of the video file for reuse and include contact information. In other cases, it may be just as easy to share some videos (as we did) directly with colleagues and students via email or other file sharing applications. When deciding whether to design and share your instructional video as OER, consider the following points on platforms, licenses, and metrics.

## Platforms

There are many online platforms available for sharing videos; some are general in nature and others cater to educational content. Video is unique in the context of digital learning objects in that it intersects with vastly popular entertainment media. While other types of learning materials, such as assessments, modules, and textbooks, might belong squarely in an OER repository, instructors looking to share videos have the option of using OER repositories, freely accessible general-use platforms like YouTube or Vimeo, or both for maximum discoverability. YouTube is the second most accessed website globally and provides the most widespread access point to online video for a general audience (Tan 2013). In terms of the visibility of instructional videos, general-use platforms offer an easier access point and are more likely to be discovered in a web search. YouTube, a subsidiary of Google, offers the added benefit of promoting their videos through their search results.

OER repositories are more likely to be accessed directly by educators and focus less on appealing to prospective learners. However, they may offer a perception of legitimacy or quality that YouTube cannot. When selecting an OER repository, instructors should consider where their video might fit given the educational level, supported media types, and subject area (Dawson n.d.). Not all repositories include videos, although some general ones such as OER Commons and Merlot include video content in their collections (OER Commons n.d.; MERLOT n.d.). It may also be worth checking if your home institution has recommendations or an institutional OER repository that will accept video content.

## Licenses

When sharing content online, creators can select a license to attach to that learning object to indicate how it can be used. Different licenses allow for varying degrees of “openness,” including how videos may be reused, shared, and edited. Creative Commons (CC) is the most well-known licensing structure that provides a variety of usage options. Creators have options from the very open Attribution (CC BY) license that lets others “distribute, remix, adapt, and build upon your work, even commercially, as long as they credit you for the original creation” to the most restrictive Attribution-NonCommercial-NoDerivs (CC BY-NC-ND) license that allows others to download and share your videos with others as long as they also credit you, but they are not allowed to change them or use them for commercial purposes (Creative Commons n.d.a.).

In some cases, platforms such as YouTube have created their own licenses that look like a CC license but essentially grant broadcasting rights to YouTube, meaning any video on the platform with that license cannot be modified or distributed in another format or on another platform without consent (Brown 2021). Creators should be aware that the default, standard YouTube license can easily be changed to a CC BY license, as long as it contains your own original content or video content that is copyright-free or licensed for reuse and sharing (Google 2021). Vimeo gives creators a more comprehensive range of licenses to choose from when uploading content to their platform (Vimeo n.d.). There is some debate among instructors, copyright experts, and open access advocates about which licenses are best for the wider network of potential learners while not discrediting the intellectual work of the creator. Open access advocates typically encourage the use of CC BY licenses because they allow the most flexible options for reuse. However, you should also consider your own goals and comfort level when sharing content (Creative Commons n.d.b). If you are not comfortable with the possibility that another entity could monetize learning materials based on your work, a more restrictive license may be a better option for you. It is always good practice to use copyright-free, CC, or public domain images, video, and audio content to include or reuse in your work. Supporting OER efforts means both creating and using open resources.

## Metrics

Sharing OER videos to publicly available platforms such as YouTube has made it possible to track usage metrics like views, shares, engagement, and reuse. These metrics, combined with student feedback and recent research in online learning methods, help us understand how to teach effectively in a digital learning environment using video content. Metrics such as view count and traffic source (e.g., other university websites or LMS) also allow instructors to demonstrate the broader impact of their OER output in tenure and

promotion processes and justify the dedication of time and resources to the development of open learning objects. This quantitative evidence provides tangible support for the argument that the creation and sharing of OER are valuable and impactful activities.

## Conclusions

While the shift to remote learning during the COVID-19 pandemic has been stressful and challenging for both students and instructors, the availability of instructional technologies to support video creation and online hosting has in some ways “cushioned the effect of the pandemic on educational activities” by providing a viable replacement for in-person teaching and learning (Adedoyin and Soykan 2020, 8). In this reflection, we have described the strategies we used to create compelling and sustainable instructional videos and how and why we decided to make some of this content available as OER. By designing some videos as OER, we expanded the utility and sustainability of the end-product for ourselves and our students, teaching and lab assistants, and colleagues. This decision allowed us to adapt much of our course content for use in other learning environments, making it suitable for multiple audiences, purposes, and contexts. The opportunity to revise existing instructional content and develop new OER has benefitted our teaching and is a practice that we will continue to explore in the future as we consider what aspects of the emergency remote learning experience should be retained when returning to the physical classroom.

## Competing Interests

The authors declare that they have no competing interests.

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