

# Beyond Video: Harnessing Multimedia for Engaging Online Courses

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## ACTION PLAN

- ✔ Choose the right multimedia for your purpose.
- ✔ Focus on multimedia quality and the learner experience.
- ✔ Leverage multimedia to build your presence as the instructor.



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## Introduction

When designing an online course, faculty will often ask about recording videos for their course. While responses to this question are varied, the first thing to do is identify the purpose. Then, you can match that purpose to the most effective method for communicating the message to students. When deciding the “most effective” methodology, you have to consider several factors: the role of instructor presence, potential cognitive distractions, and the amount of effort to create the message.

## Multimedia Is More Than Video

There is more to multimedia than just video. Video is only one of several types of multimedia presentations. In addition to video, the other multimedia types are audio, voiceover slide presentations, screencasting, and immersive video. When preparing a multimedia presentation, you will want to select the type that best meets your pedagogical needs (Crawford & Senecal, 2017).

### Audio

Audio recordings are a great way to communicate with your students while allowing your enthusiasm and personality to increase your social presence in a course. This works particularly well for providing course announcements, weekly introductions, and summaries. Another way that audio works well is by interviewing experts in the field, which can be particularly useful when meeting a subject matter expert at a conference or over the phone.

Studies have shown that video presentations are generally more effective than audio presentations (Noetel et al., 2021). However, that does not mean you should overlook audio-only elements when adding multimedia to your courses. There are situations where audio is particularly beneficial. Plus, audio presentations can save you time. They are easier to create and do not require a lot of specialized software and equipment.

There are three scenarios where audio presentations can be a good choice for delivering content to learners.

### PROVIDING LEARNER FEEDBACK

Researchers found that audio feedback can provide more details. For example, a five-minute recording contains about 625 words, equivalent to more than a page of writing. Audio feedback is also better at providing emotional connection than written feedback (Killingback et al., 2019). Additional research shows that audio feedback is personalized to the learner and, like written feedback, can be re-accessed when needed (Carruthers et al., 2015). More importantly, learners have been found to prefer audio feedback over written comments (Parkes & Fletcher, 2017). Providing audio feedback is easy, too! Many learning management systems (LMSs) allow instructors to record individualized audio feedback directly to the learner via the assignment feedback tool.

### INTERVIEWS

Faculty can use interviews to help increase learner understanding. Audio recordings of faculty-conducted interviews can provide additional insight into a subject through free-flowing conversation and probing questions. They are also easier for faculty because there is no need to include visuals. Interviews can be conducted virtually over a video-conferencing platform with only the audio recorded or in person using a mobile phone with an audio recorder.



## REACHING ALL LEARNERS

Audio-only presentations are less effective than other types of multimedia for conveying information or processes. However, they can help you reach more learners, especially students with limited internet access. That is because audio files are typically smaller in size than videos. The smaller files can be stored at a lower cost, transmitted more quickly, and use less internet bandwidth. This is an important factor, considering that about 15% of Americans do not have home internet access via a wired connection (Federal Communication Commission, 2020). While we often think about the lack of internet connectivity as an issue for those in rural areas, it is also a problem for those in urban areas, especially in older neighborhoods or apartment buildings.

### Voiceover Slide Presentation

When you have a large amount of content to present to students, the most efficient way is via a lecture (French & Kennedy, 2017). A well-designed slide presentation with a voiceover works best in this situation, as you can record audio one slide at a time. One thing to remember when using this approach is to avoid reading slides full of text. Instead, you will want more images and graphs than long phrases or sentences. These illustrations or critical points will allow the students to focus on your explanation of the information.

Voiceover slide presentations are often compared to screencast videos. However, they are not the same. The primary difference is that the visual elements of voiceover slide presentations are static images, often created from a digital slide deck. This presentation style emerged during the early days of online learning in the 1990s and early 2000s, when faculty frequently developed online presentations directly from existing slide presentations used in the classroom. Since video streaming was not widely available then, specialized software emerged to convert the slides into an easy-to-use format accompanied by narration. Despite their roots in the early days of online learning, voiceover slide presentations are still relevant and are an ideal choice when providing a short lecture on a specific topic for your students.

## Screencasting

Screencasting is a video of a computer desktop or application, usually accompanied by a voiceover. It is considered more effective than a “talking head” video, especially when explaining a complex process, as learners can see and hear your explanation (Mayer & Moreno, 2003).

If you are demonstrating a website or software, you will want to capture a video of the screen while narrating what you are doing and why in a screencast. Another thing to consider is that with a tablet, you can narrate a screencast of how to perform mathematical processes and formulas as you write them out. This would allow students to hear you talk about how to solve a problem while demonstrating it at the same time.

Screencasting can be very beneficial in many situations. Here are a few to consider for your course.

### COURSE TOUR

The central principle of QM Specific Review Standard (SRS) 1.1 is to introduce learners to your course and show them how it is organized. Creating a course tour where you can describe and show your course’s key elements is one way to meet this SRS.

### SOFTWARE/WEBSITE DEMONSTRATION

Some learners spend more time learning the technology your course uses than focusing on what your course is about. One way to help your students understand how to use the technology more quickly is to provide a short screencast that walks them through a specific course-related task. For example, if you require your students to conduct a literature review, your screencast could demonstrate how to use your library database’s more advanced search features.

## REVIEWING STUDENT ASSIGNMENTS

Creating a short screencast where you walk through an assignment a learner has submitted is an excellent way to help your learners. This can be very helpful for reviewing writing assignments where your learners provide a draft before submitting them. You can walk them through your thinking process instead of providing written feedback on the document.

## ‘KHAN-STYLE’ VIDEOS

One of the most popular types of screencasts is the “Khan style.” Guo et al. defined Khan-style videos as “full-screen video[s] of an instructor drawing freehand on a digital tablet, which is a style popularized by Khan Academy videos” (2014). This type of video is more effective than slide presentations or screencasts. One reason is that the model encourages instructors to use a “back-of-the-napkin” style of explanation instead of potentially disconnected slides (Guo et al., 2014). Instructors can then use this approach to “think aloud” as they solve mathematical equations and other types of written problems to better assist learners in understanding a process.

## Video

While video can be used for all the items mentioned above, it excels in two areas. The first is establishing an instructor’s social presence, as it can be a compelling way to build a connection with your students during a course and personal introduction. The second area that videos are effective at is demonstrating processes and scenarios, as they can be shown step-by-step in a way that allows students to see the entire process.

## ROLE OF INSTRUCTOR AND COURSE INTRODUCTIONS

We know that it is crucial to make a positive first impression on our students, and when teaching an online course, we need to make sure that we intentionally deliver that impression. This first impression will help us establish our “presence” in the course, and video can help us achieve that.

The Community of Inquiry Framework has three components:

- 1 Cognitive presence
- 2 Teaching presence
- 3 Social presence

Garrison and Arbaugh (2007) describe cognitive presence as the ability to encourage critical thinking, teaching presence as how a course is structured and facilitated, and social presence as the ability to establish open communications. Research on this framework further defines social presence as “participants identifying with the community, communicating purposefully in a trusting environment, and developing interpersonal relationships” (Garrison et al., 2010).

During the first week of an online course, students look for cues about the course and at available resources to establish an opinion of the instructor, the course, and what to expect (Dennen, 2007). As for how to communicate, Borup, West, and Graham (2011) identified that video is more effective than text for communicating personality to students. While it may be tempting to provide a voiceover slide presentation instead of a video, studies show that the presence of the instructor onscreen can lead to a higher level of instructor presence (Wang & Antonenko, 2017; Wang et al., 2020).

A dedicated course introduction video can help you meet several QM Specific Review Standards while improving your connection with students during this critical first week. Your course introduction video is an excellent opportunity to explain the purpose of the course as guided by SRS 1.2. While some of this information will also be included in your course syllabus, this is an opportunity for you to provide additional information that shows your enthusiasm for the topic. You should allow your passion for the subject to come through in your voice, body language, and any visuals that might be appropriate.

When creating a personal introductory video, SRS 1.8 suggests we share a bit of ourselves with our students. This is an opportunity for us to provide some background information about who we are, such as our professional and personal background, hobbies, interests, etc. When planning these videos, we need to consider what we will be asking our students to share when they introduce themselves as guided by SRS 1.9 so that we can model the way for our students.

## PRESENTING CONTENT TO STUDENTS

As we look at the role of video in presenting quality content to learners, there are several styles to consider.

### ✔ **Single Presenter Video**

Typically, single-presenter videos are videos where the instructor looks into the camera and lectures directly to their learners through the video. These videos may include visuals, but the primary focus is on the instructor speaking to the learners. However, these types of videos have faced criticism.

In 2001, Andrewartha and Wilmot described how multimedia was used to replicate the lecture and how this was insufficient for asynchronous learning. While multimedia allows the content to be tailored to the learner's needs, there was an over-reliance on the lecturer's performance. In other words, there was an assumption that showing the presenter's enthusiasm and passion was critical; however, it was also found that classroom lectures were too long and should not be recorded for later playback as a primary content source.

Therefore, when creating single-presenter videos, we need to consider how to leverage the social presence while balancing the length of the videos.

### ✔ **Demonstration Videos**

Another popular option is the demonstration approach, in which instructors attempt to demonstrate a process in detail to their learners. These processes might include how to approach a

lab activity, the method for solving a mathematical process, or any other procedures that a learner may need to master in a course. Demonstration videos provide an excellent supplement to written material. It has been found that learners exposed to demonstration videos perform better in pre-activity assessments and complete labs in less time than learners who only utilize written materials (Nadelson et al., 2014).

A critical difference between the lecture and demonstration videos is the primary focus of what is displayed. Van Wermeskerken and van Gog (2017) found that learners pay less attention to the demonstrated task when the instructor's face is shown. Therefore, while it is essential to establish instructor presence by showing the instructor speaking to learners in the video, the video should focus on the task as much as possible when it is being demonstrated.

### ✔ **Lightboard Videos**

Lightboard videos are similar to "Khan-style" videos, except the presenter is writing on a clear board in front of them so that both the instructor and their writing are visible onscreen. One of the earliest usages of this approach was the BBC and Hans Rosling's 2010 "The Joy of Stats" video. While this format may have visual appeal, Jose et al. (2021) found no correlation between this approach and learner preference and little correlation to performance when comparing "Khan-style" videos to lightboard videos.

### ✔ **Tutoring Videos**

A tutoring video features an instructor explaining a concept to one or two tutees. These tutees ask the instructor questions to better understand the idea being presented. Chi et al. (2016) investigated these types of videos and found that the social presence of the tutors in the video contributed to viewer learning. They identified that since the tutors were novices in the topic, the tutors asked questions that learners might also ask, providing an opportunity for the instructor to emphasize key concepts or present the content differently.

## Immersive Videos

Virtual reality (VR) is a modality that is slowly becoming more available, and immersive video allows faculty to create their own VR content without needing to learn how to use specialized programming environments. Immersive video is also known as a virtual field trip, as it allows you to immerse a learner in a remote environment.

Setting up active learning experiences, as mentioned in SRS 5.2, can be challenging, where students learn by “doing” something in any course. One learning environment that provides an immersive and engaging learning experience is that of virtual reality (VR). While computer-generated VR environments can be expensive to create and update, a type of VR that instructors can make without extensive technology expertise or investment is immersive 360 videos, also referred to as virtual field trips.

As Radianti et al. (2020) explain, virtual reality immerses users in audio/visual environments so that they feel present. With immersive 360 video, learners can control the video to thoroughly explore their environment without altering it (Blair et al., 2021). A study by Petersen et al. (2020) found that providing a narrated immersive 360-degree video increased learners’ self-efficacy, interest, and knowledge of the topic area, confirming previous studies.

Learners have several options for using immersive 360 videos. One is to use a VR headset to have a fully immersive audiovisual experience. If using a VR headset is not a good option, either due to cost or if the learner has vertigo, learners can use their phone by placing it within a holder such as [Google Cardboard](#). A third option is a “magic window,” where the learner views the content on their computer screen and controls their point of view via their mouse. When comparing the immersive and desktop experiences, Zhao et al. (2022) found that learners who participated in the immersive experience reported “higher ratings of spatial presence, enjoyment, and satisfaction than students who experienced the same content through a desktop computer.” However, Zhao et al. also noted that

participating in the experience with their desktop required less time and effort for learners to become familiar with the interface, and these learners performed similarly or better on exams than those using the immersive experience.

## Design and Production Considerations

Ideally, you can work with multimedia specialists who manage the design and production process, especially for more complicated presentations. These individuals assist by:

- Providing expert assistance in capturing/filming your presentation.
- Providing expertise in editing the video and adding computer-generated graphics.
- Helping in the planning process to determine whether visuals should be added during editing or whether they should be on a board next to you while recording.
- Helping to set up the lighting to ensure visual clarity and confirm that your audio is recorded clearly.
- Adding other visuals to your video, such as a title card or content graphics.
- If you must complete your presentation in multiple “takes,” the videographer can edit those together to create a single continuous video presentation.

However, many faculty members cannot access such specialists and must utilize a do-it-yourself approach. The simplest way to do this is to create a video in one “take.”

- Place your camera on a tripod and aim the camera at where you will stand.
- Once recorded, you will need only to trim the beginning and end of a video using basic video editing software.
- Some instructors will present in front of a board or flip chart with premade graphics that they can reference during the video.

## Begin with Quality Audio

Before you begin recording, ensure a high-quality microphone, a quiet place to record, and a plan for what you will say.

While you can record with any microphone, including those built into your mobile device and laptop, make sure you speak as close to your microphone as possible to minimize background noise. An external microphone can help improve the quality of your audio, but you need to ensure you get the correct type of microphone.

- **Unidirectional**—Unidirectional microphones capture audio from one direction to minimize background noise. They are best for a single person.
- **Bidirectional**—Bidirectional microphones capture audio from two directions and are helpful for interviews when placed between the two speakers.
- **Omnidirectional**—Omnidirectional microphones capture audio from all directions. They are the type of microphone found on most laptops.

You will want to experiment and conduct several test recordings to determine where the microphone should be placed for optimal recording. You will want to avoid turning away from the microphone, as this can cause the audio to fade, especially if you use a unidirectional microphone. That is one reason many people use a quality headset with a microphone.

Some microphones, such as omnidirectional microphones, will pick up background noises from within the room; therefore, you will want to find a quiet place to record. While noises that can be heard outside the room may be picked up by your microphone, you will also want to be aware that other noise sources include electrical interference from lights, fans, and HVAC systems.

When you are ready to record audio, think about what you want to say before pressing the record button. If you will provide spontaneous comments, write down a few keywords to ensure you have addressed all your intended points. When recording audio, you can attempt to record the entire presentation at one

time, or you can record the audio one slide at a time. The advantage of recording the presentation all at once is that it is quicker than recording one slide at a time, but editing pauses and mistakes can be more challenging. Some will record one slide at a time to make it easier to eliminate errors, but this can make it difficult to keep a consistent tone and flow throughout the presentation. When you are recording, make sure that you wait three seconds between pressing the start button and speaking. Pause again at the end of your recording before hitting stop. Having this space at the beginning and end of your recording will ensure you do not inadvertently cut off any of your words.

## Visual Design

The primary goal of your slides in a voiceover slide presentation is to provide critical cues to your students. Mayer (2001) guides developing multimedia presentations by highlighting essential items while avoiding unnecessary images and text that can distract students.

### TEXT

When using text on your slides, use only keywords from the spoken portion of your presentation. These keywords will assist the students in understanding the intended structure of the presentation and, therefore, provide a framework for their notetaking. If you are quoting others and the quote is long, you should only put the essential parts of the quote on the slide. These strategies will also help prevent you from reading the slides to the students.

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## FONT

There is often a debate as to which font you should consider using. There are two categories of fonts to choose from — serif fonts, which have flourishes, such as Times New Roman and Garamond, and sans serif fonts, including Verdana and Arial, which do not have these flourishes. While serif fonts are often considered the preferred font for printed materials and sans serif fonts are preferred for computer screens, Ali et al. (2013) found no significant differences between these font categories regarding text readability on computer screens. Regardless of which font you choose, you must ensure it is easy to read.

## IMAGES

Images can provide your students with critical information during your presentation. Images can communicate emotion or information depending on your intent. When describing a social or environmental situation, choose an image that best represents the feelings you want to supplement your vocal presentation. Informational images include diagrams and other images to supplement your description of an object. For example, if you describe the parts of a device or another item, include labels so students can follow along more quickly.

When designing content for the screencast, avoid using only static images. A study by Guo, Kim, and Rubin (2014) discovered that students prefer animated screencasts and perceive them to be more engaging than static slides with voice-overs. To create animation and focus attention, try drawing boxes around important information or zooming toward the area being highlighted in your presentation.

## FACULTY PRESENCE

There have been several studies related to the importance of being able to see the presenter in a video presentation. The results from studies focusing on the importance of social presence often find no difference in whether the presenter is onscreen. However, some guidance is available from these studies.

Some argue that voiceover slide presentations are only effective if you can see the faculty member presenting the material. Some studies report that students prefer seeing the instructor because the students believe the instructor's video provides social cues (Kizilcec et al., 2015). However, the same study found that many students do not look at the instructor. There was no significant difference in student learning performance between presentations with and without the instructor being present in the video. Therefore, including a video of yourself presenting the material in the corner of the presentation can be considered extraneous, and you can exclude it.

Faculty presence in screencasts has been shown to increase student satisfaction (Wang & Antonenko, 2017). However, it is recommended that faculty limit their appearance to the beginning or end of the screencast. Van Wermeskerken and van Gog (2017) found that students pay less attention to the instruction provided and focus more on the faculty member while onscreen. Additionally, Mathieson (2012) noted that students prefer hearing the instructor's voice and seeing guidance captured on the screen, especially through pointing to and highlighting essential items.

One of the key things an instructor can do while on camera is to utilize the visuals and then shift their gaze from the camera to the relevant portion of the visual. By doing this, learners will shift their attention from the instructor to the visuals they are referencing. Wang, Pi, and Hu (2018) found that having the presenter shift their gaze can both increase social presence and more quickly direct the learners' attention to the relevant part of the screen.



## Length of Video

Cognitive load theory is based on the premise that a learner’s working memory is limited. For something to be retained, a learner must be able to transfer this information from their working memory to long-term memory. This learning theory guides us to reduce unnecessary distractions and encourages us to “chunk” content to be more efficiently processed from working memory to long-term memory (Tempelman-Kluit, 2006). In addition, chunking the content into segments gives the learners more control over their learning (Brame, 2015; Ljubojevic et al., 2014).

We have been searching for the optimal length for a multimedia presentation, and several studies have different suggestions. Some of these suggestions for length include three to four minutes (Clossen, 2018), three to seven minutes (Buzzetto-More, 2014), six minutes (Guo et al., 2014), six to 12 minutes (Fishman, 2016), and under 15 minutes (Berg et al., 2014). Afify (2020) found that students performed better on post-tests when the videos were less than six minutes long compared to those that were six to 12 minutes long or longer than 12 minutes. The author cites that the performance improvement may be related to shorter videos being more focused than longer videos, avoiding overloading working memory, being better aligned with a content-chunking strategy, and allowing for various active learning activities that include interactive questions or pause procedures.

Regardless of the length of your presentations, the most crucial consideration is your content and what you are trying to communicate. When designing your presentations, ask yourself if there are points where you want the learner to pause and reflect on what they have just seen and heard before moving forward

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to the next item. These points are an excellent place to consider ending one presentation and starting the next one. Suppose the topic you are explaining has three parts. In that case, consider having a separate presentation for each part and then an additional presentation showing how the three parts interrelate.

Also, chunking content into smaller pieces helps your students learn the content better and makes it easier to edit in the future. For example, rerecording a single six-minute presentation is more manageable than revising a 60-minute one.

## Video Production Tips

For your first course video, an introductory video is an excellent choice for learning how to set up and create a video. There are several things to consider before beginning your video, including equipment. If you already have access to everything you need, you must only be mindful of a few technical things to succeed. In addition to a microphone, you will need the following items.

### PERSONAL VIDEO EQUIPMENT AND SETUP

#### ✔ Camera

First, you need a camera that records high-definition video. These types of cameras are built into most laptops and mobile devices. You may come across numbers like 1080p or 4K. These numbers refer to the amount of “lines” or vertical pixels. While 4K is a higher resolution than 1080p, 1080p is the most common video resolution for the type of video faculty create for their courses.

#### ✔ Lighting

Second, you need to consider lighting. Ensure you minimize the number of light sources behind you, as this can cause you to look like a dark silhouette onscreen. To prevent this, you want your primary light source, such as your desk lamp, window, and sunlight, behind your camera to shine on you from an angle. Having two light sources at opposite angles behind the camera can help reduce odd shadows on your face. Also, do not rely on your computer monitor as a light source; it can make you look bluish or another color.

## TECHNIQUE AND APPROACH TO RECORDING VIDEO

### ✔ Be Prepared

When recording a video, know what you will say before beginning. Some prefer to write down only a few thoughts and then try to record based on this list. However, this can lead to videos that are longer than intended. I have found it easier to script things beforehand and practice before recording. This approach also helps you record your introductory video in a single attempt, thus reducing the need to edit your video extensively. Additionally, it makes it easier to provide a transcript.

### ✔ Camera Angle

When setting up your webcam, position the camera so the lens is leveled with your face. You can raise the laptop on a book using the camera built into your laptop. When your camera is at or near eye level, it is similar to looking straight at your audience. Make sure your camera is not lower than your face. That angle is less flattering and can make it appear that you are looking down on your audience.

If you create a process video, you will want to ensure that the camera is close to the demonstration area and focused on that area. You will also want to ensure that neither you nor the camera cast a shadow in that area, as it may distract learners.

### ✔ Get in Position

Another question is how you should position yourself within the video. In other words, do you just show your face, from the shoulders and above, or your entire upper body? It is best to avoid being too close to the camera where only your face is visible, as this might feel too close to your students viewing the video. If you have many hand motions when speaking, you want to show your entire upper body so that your hands will be visible most of the time. Regardless of body positioning, position the camera to be centered within the frame unless you use a specific stylistic approach. Finally, ensure the camera is on the same level as your nose or slightly above, as this will provide a more flattering view.

### ✔ Look at the Camera

You also want to look directly at the camera and not at your script, which might be to the side or below the camera, nor at your view screen where you see yourself. By looking directly at the camera, you are looking directly at your students. When your eyes shift slightly in any direction, it can look like you are looking beyond your students. While it is natural to occasionally look away from the camera, doing this too often can distract your audience.

### ✔ Take a Pause

After you start recording, pause and look at the camera for at least three seconds before speaking. When you are finished, look at the camera for another three seconds before stopping it. This pause before and after your recording allows you to easily trim the video by providing a clear gap that you can cut later.

## EDITING A VIDEO

When editing a video, you can use any basic video editing software often available for your phone, tablet, or some computers. There are only a few basic features you need to learn:

- **Clip/trim:** This will allow you to remove the few seconds between starting and ending the recording and beginning and finishing presenting.
- **Title screen:** This is a graphic you can create that provides the title of your video. It can also be reused as the thumbnail for the video presented in the LMS when your video is not being played.
- **Lower-thirds:** This is the term for text at the bottom of the screen that is often used to identify speakers in the video. This text can be helpful when you have guest speakers.
- **Transitions:** If you need to combine multiple clips of videos into one video, use transitions where one clip fades into another.

While there are many ways to polish your video, these basic functions will help you quickly publish it to a video-hosting website.

## CREATING SCREENCASTS

Screencasting is similar to creating a video. The difference is that you use specialized software to capture your computer or device’s screen. Free options are available with computer and mobile device systems and other applications.

## CREATING IMMERSIVE 360 VIDEOS

Creating immersive 360 videos requires more specialized equipment than your computer or phone camera.

### ✔ Equipment

You will need a camera capable of taking 360-degree videos, such as the [Insta360](#), [Rico Theta](#), or [GoPro Max](#). These cameras work for taking videos because they have a front and a back lens to simultaneously combine both views into a nearly seamless, immersive 360 video. Also necessary is a camera stand with a narrow but stable base to keep the camera from moving without being in the picture the way a regular tripod would be. An optional piece of equipment that can be helpful is a wireless microphone, such as the [RØDE wireless microphone](#), which enables you to eliminate the background noise that would be captured with the camera’s built-in microphone. Some cameras offer a bracket for purchase that hides the microphone receiver within the camera’s blind spot.

### ✔ Production Tips

Here are a few production tips to help you meet SRS 8.6 (adapted from Argyriou et al., 2020):

- When placing the camera, consider the viewer’s location within the scene. You will want to position the camera where the learner would be and ensure the lens is at the appropriate eye level. This point of view is essential, as the learner will see this.
- Situate people or items you do not want to be part of the learner’s view outside of the room or behind other objects.
- Keep the camera still while recording because moving can cause the learner to become disoriented or experience motion sickness. (An exception to this is when the viewer is seated in a moving vehicle and has been told in advance that motion will be taking place.) Instead, focus the learner on what you want them to see by instructing them to look at a specific area or using graphics to direct the activity.
- To “zoom in” on an area, overlay a photo of it on the final video rather than moving the camera closer to the area, again, to avoid the learner becoming disoriented or motion sick.
- To move from one location to another, create a video transition as you would in a 2D video.
- Aim for the highest-quality, most life-like video possible. VR headsets are increasingly capable of playing high-resolution videos, and research has shown that higher resolution helps minimize the motion sickness some users experience.

### ✔ Editing Tips

The software that comes with the camera is sufficient for basic editing. However, you may need a more advanced tool like [Adobe Premiere Pro](#) or [Davinci Resolve](#) to add graphics and images. Once your video is ready, it must be uploaded to/hosted on a site that can play it properly. Fortunately, YouTube is one such site. To further support meeting SRS 8.6, YouTube provides the ability to embed a 2D “magic window” within the LMS and a link to a version that can be viewed with a VR headset. To make this content more accessible, as guided by SRS 8.5, you will want to ensure you are providing captions and a transcript that includes both what you are saying and a description of what you are showing.



## Provide Accurate Captions and Transcripts

Discussions about captioning often center around providing an alternative source of educational content for learners who are deaf or hard of hearing. However, captions are a critical multimedia and video-content component that assists all learners regardless of ability.

### TYPES OF CAPTIONS

There are two common types of captions — open and closed. Open captions appear on the screen and cannot be turned off, while closed captions can be turned on or off as desired by the viewer (United States National Institutes for Health, 2017). However, the content of the captions can vary. Many video captions provide a direct transcription of what was said by the speaker. Some videos, though, provide additional information through descriptive captions. Descriptive captions typically address influential background sounds, such as a device clicking, the tone of the music, etc.

### IMPORTANCE OF CAPTION ACCURACY

Broadcast television, which initiated the use of captioning, serves as a guide for the accuracy needed when adding captions to a course’s multimedia and video content. While we should always strive for 100% accuracy, the broadcast standard for captions is 98%. During the 2020 Super Bowl broadcast, a transcriptionist provided captions in real-time, which were found to be 99.42% accurate. While most of the errors were minor — consisting of typos and delays of more than seven seconds — 1.77% were considered serious, as the information provided was misleading to the viewer (Fresno et al., 2020).

A review of 68 minutes of course videos automatically captioned by YouTube’s speech-to-text system found 525 errors for an average rate of 7.7 per minute (Parton, 2016). While technology has improved since this study, the error rate is still a substantial barrier. A 2020 review of 20 commencement addresses that used captions provided by YouTube’s automated

system found 460 errors over 200 minutes of video. That is an error rate of one mistake every 26 seconds. The most common error occurs when the system replaces one word with another. This happens most often with nouns, which account for nearly a third of the errors, followed by verbs at just over 20% (Lee & Cha, 2020). These results highlight that despite the improvement, speech-to-text technology cannot yet be solely relied on to provide captions that will benefit our learners.

### USE OF CAPTIONS BY LEARNERS

A 2006 survey of television viewers in the United Kingdom found that nearly 7.5 million people were using captions despite about 6 million — or 80% — of respondents not having a hearing impairment (United Kingdom Office of Communications, 2006).

More recent surveys have provided us with additional details. In a 2022 survey, it was determined that 50% of all Americans watch video content with subtitles turned on most of the time. In addition, 70% of Gen Z was found to utilize captions. While the majority of the respondents indicated that they were using captions because the audio was hard to understand or muddled, 29% indicated they were doing so to avoid disturbing others, and 27% stated it helped them stay focused on the screen (Mykhalevych, 2024). This was further supported by a 2023 YouGov survey focused on television and captions, which found that 18 to 29-year-olds were most likely to have captions turned on (63%), a rate nearly double that of all older age groups. They also found that “Hispanic Americans (54%) are more likely than Black Americans (40%) or white Americans (33%) to say they prefer having the subtitles on when watching TV in a language they know” (Ballard, 2023).

In higher education, research has shown that most students utilize captions at least sometimes, even if they are not deaf or hard of hearing (Stritto & Linder, 2017; Edelberg, 2019). Learners typically used captions to (1) help them maintain focus, (2) watch videos in sound-sensitive or noisy environments, and (3) learn vocabulary, decipher thick accents, or overcome poor audio quality.

Several studies have shown that the use of captions can improve learner achievement. The availability of captions has been shown to motivate learners, as the captions help them keep track of the narration (Ozdemir et al., 2016). In addition, captions help ESL students learn English sounds more efficiently (Birulés-Muntané & Soto-Faraco, 2016). Finally, Kim and Kim found that using open captions augmented the cognitive load and thus allowed the learners to better recall the information presented (2020).

## HOW TO IMPROVE CAPTIONS FOR ALL LEARNERS

Regardless of whether you or a third party creates the captions for multimedia and video content, the Described and Captioned Media Program (DCMP) recommends that captions be:

- Synchronized and appear at approximately the same time as the audio is available
- Verbatim when time allows (or be as close to verbatim as possible)
- Equivalent and equal in content
- Accessible and readily available to those who need or want them

For the captions to be as usable as possible, the DCMP further recommends that the following principles be followed when possible:

- Captions appear on the screen long enough to be read
- Onscreen captions should be limited to no more than two lines
- Speakers should be identified when more than one person is onscreen or when the speaker is not visible
- Punctuation is used to clarify the meaning
- Spelling is correct throughout the production
- Sound effects are written when they add to the understanding
- All actual words are captioned, regardless of language or dialect
- The use of slang and accent is preserved and identified (Described and Captioned Media Program, 2021)

When using YouTube or a third party to create captions, you must verify the accuracy of the captions and correct any errors you find. One way to assist in this is to write a script before recording. Doing so lets you quickly review and compare the captions to your script. If you find an error in the captions, you can easily cut and paste the correct text into the captions. You can also utilize the [Captioning YouTube Videos](#) guide from the National Center on Disability and Access to Education, which shows how to edit YouTube captions.

## Focus on Quality

Creating multimedia presentations increases instructor presence significantly and communicates critical course content and information to learners. The QM Rubric emphasizes the importance of including multimedia in a high-quality online course.

First, you need to consider the appropriateness of multimedia and what type to use. Several QM Specific Review Standards (SRSs) from the [QM Higher Education Rubric](#), Seventh Edition, should be considered when doing this. SRS 4.5 states that “A variety of instructional materials is used in the course,” and SRS 6.3 states, “A variety of technology is used in the course” (Quality Matters, 2023). Therefore, any multimedia presentations you create for your course will be considered by reviewers to support these Standards. While it may be easy to use pre-existing materials from other online resources and publishers, you will want to, at a minimum, supplement those materials with other instructional presentations that you have created.

Another Standard to consider is SRS 8.6, which says, “Multimedia in the course is easy to use” (Quality Matters, 2023). To help meet this Standard, you will want to ensure that you have reduced distractions by providing purposeful visuals that establish instructor presence or focus attention on the presented content. For example, when you provide a lecture, a voiceover slide presentation containing visuals or keywords related to the content is better than a video of you speaking into the camera. In addition,

you will want to ensure that you have appropriately segmented your multimedia presentations by chunking them. You will also want to ensure that your audio is clear and free of distractions.

As a method of providing feedback to your learners, provide audio feedback. However, you will want to communicate this to them as guided by SRS 5.3: “The instructor’s plan for interacting with learners during the course is clearly stated ” (Quality Matters, 2023).

To meet SRS 8.5, “Video and audio content in the course is accessible” (Quality Matters, 2023), you will want to provide captions or a transcript for all of the multimedia in your course.

One of the first videos you may want to create is an introduction video where you can introduce the purpose and structure of the course as guided by SRS 1.2 and a screencast course tour to meet the expectations of SRS 1.1. You may also want to record a self-introduction to welcome your learners as guided by SRS 1.8.

Finally, you may want to create an immersive 360-degree video to transport your learners to an environment other than where they typically participate in learning activities. This type of video supports SRS 6.2, “Course tools promote learner engagement and active learning,” as it allows students to simulate and explore an immersive environment.

However, if you choose to implement multimedia in your course, make sure you are focused on the learner experience and how the multimedia will help learners achieve the course’s learning outcomes. As technology has advanced over the past years, it has become easier to create multimedia content. Students do not expect it to be perfect, but it must be better than good enough. As you begin to use multimedia, start with small items such as your instructor introduction and course/module introductions. Then, add more items where you present course content so students can see your passion for the topic and develop a better connection with you as their instructor.

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## References

Affy, M. K. (2020). Effect of interactive video length within e-learning environments on cognitive load, cognitive achievement and retention of learning. *Turkish Online Journal of Distance Education*, 21(4), 68–89. <https://doi.org/10.17718/tojde.803360>

Ali, A. Z. M., Wahid, R., Samsudin, K., & Idris, M. Z. (2013). Reading on the computer screen: Does font type have effects on web text readability? *International Education Studies*, 6(3), 26–35. <https://doi.org/10.5539/ies.v6n3p26>

Andrewartha, G., & Wilmot, S. (2001). Can multimedia meet tertiary educational needs better than the conventional lecture? A case study. *Australasian Journal of Educational Technology*, 17(1), 1–20. <https://doi.org/10.14742/ajet.1769>

Argyriou, L., Economou, D., & Bouki, V. (2020). Design methodology for 360° immersive video applications: The case study of a cultural heritage virtual tour. *Personal and Ubiquitous Computing* 24, 843–859. <https://doi.org/10.1007/s00779-020-01373-8>

Ballard, J. (2023, August 11). Most American adults under 30 prefer watching TV with subtitles — even when they know the language. *YouGov*. <https://today.yougov.com/entertainment/articles/45987-american-adults-under-30-watching-tv-subtitles>

- Berg, R., Brand, A., Grant, J., Kirk, J. S., & Zimmerman, T. (2014). Leveraging recorded mini-lectures to increase student learning. *Online Classroom*, 14(2), 5, 7. [https://www.teachingprofessor.com/topics/teaching-strategies/teaching-with-technology/leveraging\\_recorded\\_mini\\_lectures\\_to\\_increase\\_student\\_learning/](https://www.teachingprofessor.com/topics/teaching-strategies/teaching-with-technology/leveraging_recorded_mini_lectures_to_increase_student_learning/)
- Birulés-Muntané J., & Soto-Faraco S. (2016). Watching subtitled films can help learning foreign languages. *PLoS ONE*, 11(6). Article e0158409. <https://doi.org/10.1371/journal.pone.0158409>
- Blair, C., Walsh, C., & Best, P. (2021). Immersive 360° videos in health and social care education: A scoping review. *BMC Medical Education*, 21, Article 590. <https://doi.org/10.1186/s12909-021-03013-y>
- Borup, J., West, R. E., & Graham, C. R. (2011). Improving online social presence through asynchronous video. *Internet and Higher Education*, 15(3), 195–203. <https://doi.org/10.1016/j.iheduc.2011.11.001>
- Brame, C.J. (2015). Effective educational videos. *Vanderbilt University Center for Teaching*. <https://cft.vanderbilt.edu/guides-sub-pages/effective-educational-videos/>
- Buzzetto-More, N. A. (2014). An examination of undergraduate student’s perceptions and predilections of the use of YouTube in the teaching and learning process. *Interdisciplinary Journal of E-Learning and Learning Objects*, 10, 17–32. <https://www.semanticscholar.org/paper/An-Examination-of-Undergraduate-Student’s-and-of-of-Buzzetto-More/6d48640f9f9a1702c13f30a662b115b16ca8ab07>
- Carruthers, C., McCarron, B., Bolan, P., Devine, A., McMahon-Beattie, U., & Burns, A. (2015). ‘I like the sound of that’ – an evaluation of providing audio feedback via the virtual learning environment for summative assessment. *Assessment & Evaluation in Higher Education*, 40(3), 352–370. <https://doi.org/10.1080/02602938.2014.917145>
- Chi, M. T. H., Kang, S., & Yaghmourian, D. L. (2016). Why students learn more from dialogue- than monologue- videos: Analyses of peer interactions. *Journal of the Learning Sciences*, 26(1), 10–50. <https://doi.org/10.1080/10508406.2016.1204546>
- Clossen, A. S. (2018). Trope or trap? Role-playing narratives and length in instructional video. *Information Technology and Libraries*, 37(1). <https://doi.org/10.6017/ital.v37i1.10046>
- Crawford, S. R., & Senecal, J. (2017). Tools of the trade: What do you need to flip? In L. S. Green, J. R. Banas, & R. A. Perkins, (Eds.), *The flipped college classroom: Conceptualized and re-conceptualized* (pp. 37–50). Cham, Switzerland: Springer International Publishing.
- Dennen, V. P. (2007). Presence and positioning as components of online instructor persona. *Journal of Research on Technology in Education*, 40(1), 95–108. <https://doi.org/10.1080/15391523.2007.10782499>
- Described and Captioned Media Program. (2021). Caption it yourself: Basic guidelines for busy teachers, families, and others who shoot their own videos. *DCMP Learn Center*. <https://dcmp.org/learn/213>
- Edelberg, E. (2019, June 3). Study shows adding captions improves faculty evaluations + helps students learn. *3PlayMedia*. <https://www.3playmedia.com/blog/captions-improves-faculty-evaluations-and-helps-students-learn/>
- Federal Communication Commission. (2020, April). 2020 broadband deployment report (FCC 20–50). *FCC*. <https://docs.fcc.gov/public/attachments/FCC-20-50A1.pdf>



- Fishman, E. (2016). How long should your next video be? *Wistia*. <https://wistia.com/learn/marketing/optimal-video-length>
- French, S., & Kennedy, G. (2017). Reassessing the value of university lectures. *Teaching in Higher Education*, 22(6). <https://doi.org/10.1080/13562517.2016.1273213>
- Fresno, N., Sepielak, K., & Krawczyk, M. (2020). Football for all: The quality of the live closed captioning in the Super Bowl LII. *Universal Access in the Information Society*. <https://doi.org/10.1007/s10209-020-00734-7>
- Garrison, D. R., & Arbaugh, J. B. (2007). Researching the Community of Inquiry Framework: Review, issues, and future directions. *The Internet and Higher Education*, 10(3), 157–172. <https://doi.org/10.1016/j.iheduc.2007.04.001>
- Garrison, D. R., Anderson, T., & Archer, W. (2010). The first decade of the community of inquiry framework: A retrospective. *The Internet and Higher Education*, 13(1-2), 5–9. <https://doi.org/10.1016/j.iheduc.2009.10.003>
- Guo, P. J., Kim, J., & Rubin, R. (2014). How video production affects student engagement: An empirical study of MOOC videos. *Proceedings of the first ACM conference on Learning @ scale conference (L@S '14)*. <https://doi.org/10.1145/2556325.2566239>
- Jose, S., Kochandra, R., & Daniel, S. (2021). Instructional videos, conceptual understanding and self-efficacy in the time of COVID. *International Journal of Innovation in Science and Mathematics Education*, 29(3). <https://doi.org/10.30722/ijisme.29.03.001>
- Kim, H., & Kim, K. (2020). Open captioning as a means of communicating health information: The role of cognitive load in processing entertainment-education content. *Journal of Broadcasting & Electronic Media*, 64(3). <https://doi.org/10.1080/08838151.2020.1796392>
- Kizilcec, R. F., Bailenson, J. N., & Gomez, C. J. (2015). The instructor's face in video instruction: Evidence from two large-scale field studies. *Journal of Educational Psychology*, 107(3), 724–739. <https://doi.org/10.1037/edu0000013>
- Lee, J., & Cha, K. (2020). An analysis of the errors in the auto-generated captions of university commencement speeches on YouTube. *The Journal of Asia TEFL*, 17(1). <https://doi.org/10.18823/asiatefl.2020.17.1.9.143>
- Ljubojevic, M., Vaskovic, V., Stankovic, S., & Vaskovic, J. (2014). Using supplementary video in multimedia instruction as a teaching tool to increase efficiency of learning and quality of experience. *The International Review of Research in Open and Distance Learning*, 15(3). <https://doi.org/10.19173/irrodl.v15i3.1825>
- Mathieson, K. (2012). Exploring Student Perceptions of Audiovisual Feedback via Screencasting in Online Courses. *American Journal of Distance Education*, 26(3), 143–156. <https://doi.org/10.1080/08923647.2012.689166>
- Mayer, R. E. (2001). *Multimedia learning*. New York: Cambridge University Press.
- Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist* 38(1) 43–52. [https://doi.org/10.1207/S15326985EP3801\\_6](https://doi.org/10.1207/S15326985EP3801_6)
- Nadelson, L. S., Scaggs, J., Sheffield, C., & McDougal, O. M. (2014). Integration of video-based demonstrations to prepare students for the organic chemistry laboratory. *Journal of Science Education and Technology*, 24(4), 476–483. <https://doi.org/10.1007/s10956-014-9535-3>

Noetel, M., Griffith, S., Delaney, O., Sanders, T., Parker, P., del Pozo Cruz, B., & Lonsdale, C. (2021). Video Improves Learning in Higher Education: A Systematic Review. *Review of Educational Research, 91*(2), 204–236. <https://doi.org/10.3102/0034654321990713>

Ozdemir, M., Izmirli, S., & Sahin-Izmirli, O. (2016). The effects of captioning videos on academic achievement and motivation: Reconsideration of redundancy principle in instructional videos. *Educational Technology & Society, 19*(4). <https://www.jstor.org/stable/jeductechsoci.19.4.1>

Parkes, M., & Fletcher, P. (2016). A longitudinal, quantitative study of student attitudes towards audio feedback for assessment. *Assessment & Evaluation in Higher Education, 42*(7), 1046–1053. <https://doi.org/10.1080/02602938.2016.1224810>

Parton, B. (2016). Video captions for online courses: Do YouTube’s auto-generated captions meet deaf students’ needs? *Journal of Open, Flexible, and Distance Learning, 20*(1). <https://www.learntechlib.org/p/174235/>

Petersen, G. B., Klingenberg, S., Mayer, R. E., & Makransky, G. (2020). The virtual field trip: Investigating how to optimize immersive virtual learning in climate change education. *British Journal of Educational Technology, 51*(6), 2099–2115. <https://doi.org/10.1111/bjet.12991>

Mykhalevych, N. (April 17, 2024). Survey: Why America is obsessed with subtitles. *Preply*. <https://preply.com/en/blog/americas-subtitles-use/>

Quality Matters. (2023). *QM Higher Education Rubric, Seventh Edition*. Used under license. All rights reserved. Retrieved from MyQM.

Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. *Computers & Education, Volume 147*, <https://doi.org/10.1016/j.compedu.2019.103778>

Stritto, M. E. D., & Linder, K. (2017). A rising tide: How closed captions can benefit all students. *EDUCAUSE Review*. <https://er.educause.edu/articles/2017/8/a-rising-tide-how-closed-captions-can-benefit-all-students>

Tempelman-Kluit, N. (2006). Multimedia Learning Theories and Online Instruction. *College & Research Libraries, 67*(4), 364–369. <https://doi.org/10.5860/crl.67.4.364>

United Kingdom Office of Communications. (2006, March 3). Television access services review. *United Kingdom Office of Communications*. <https://www.ofcom.org.uk/consultations-and-statements/category-1/accessservs>

United States National Institutes for Health. (2017, July 5). Captions for deaf and hard-of-hearing viewers. *United States Department of Health and Human Services*. <https://www.nidcd.nih.gov/health/captions-deaf-and-hard-hearing-viewers>

Van Wermeskerken, M., & van Gog, T. (2017). Seeing the instructor’s face and gaze in demonstration video examples affects attention allocation but not learning. *Computers and Education, 113*, 98–107. <https://doi.org/10.1016/j.compedu.2017.05.013>

Wang, H., Pi, Z., & Hu, W. (2018). The instructor’s gaze guidance in video lectures improves learning. *Journal of Computer Assisted Learning, 35*(1), 42–50. <https://doi.org/10.1111/jcal.12309>

Wang, J., & Antonenko, P. D. (2017). Instructor presence in instructional video: Effects on visual attention, recall, and perceived learning. *Computers in Human Behavior*, 71, 79–89. <https://doi.org/10.1016/j.chb.2017.01.049>

Wang, J., Antonenko, P., & Dawson, K. (2020). Does visual attention to the instructor in online video affect learning and learner perceptions? An eye-tracking analysis. *Computers & Education*, 146. <https://doi.org/10.1016/j.compedu.2019.103779>

Zhao, J., Wallgrün, J. O., Sajjadi, P., LaFemina, P., Lim, K. Y., Springer, J. P., & Klippel, A. (2022). Longitudinal effects in the effectiveness of educational virtual field trips. *Journal of Educational Computing Research*, 60(4), 1008–1034. <https://doi.org/10.1177/07356331211062925>

## Original Articles

Crawford, S. R. (2024, August 21). Producing 360-Degree Videos to Design Immersive Experiences for Your Learners. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/virtual-reality-videos>

Crawford, S. R. (2022, October 19). Creating Process Demonstration Videos. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/videos-for-process-explanation>

Crawford, S. R. (2022, June 22). Creating social presence with single presenter videos. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/videos-for-creating-presence>

Crawford, S. R. (2022, March 15). The role of audio presentations. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/using-audio-presentations>

Crawford, S. R. (2021, July 21). Voiceover slide presentations: Why you should add them to your course. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/voiceover-presentation-tips>

Crawford, S. R. (2021, February 15). Captions help ALL learners. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/captions-help-all-learners>

Crawford, S. R. (2020, October 21). Discover the Power of Screencasting. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/power-of-screencasting>

Crawford, S. R. (2020, July 20). Strategies for Improving Video Conferences and Webinars. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/improve-video-meetings>

Crawford, S. R. (2020, February 12). Making a first impression with your introduction videos. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/how-to-make-video-introductions>

Crawford, S. R. (2019, December 18). Designing multimedia presentations for your course. *Quality Matters*. <https://www.qualitymatters.org/qa-resources/resource-center/articles-resources/designing-multimedia-for-courses>