

## Teaching Hidden Knowledge

By John Orlando

I recently taught my son how to drive a stick shift. I sat in the passenger seat explaining how to work the pedals and the shift, and he did what everyone does in that situation: jerk, stall, jerk, stall, and feel frustration. He was doing exactly what I was telling him to do, but it wasn't working.

At first I just repeated my instructions and told him to keep trying until he gets it right. But then I discovered that part of his problem was that I was leaving a lot of information out of my instructions. I told him to lift his foot off the clutch and hit the accelerator to get started, but in thinking about it I realized that when starting in first gear I didn't hit the accelerator. I simply took my foot off of the clutch and let the car roll forward.

This is a good example of hidden knowledge. Some of what I knew about driving a clutch I didn't even know that I knew, and because of that was leaving it out of my instructions. I had fallen victim to the "expert's blind spot," the inability of experts to see the problems of novices because they cannot see through the eyes of novices. Experts come to a situation with background knowledge that helps them understand the problem and what is

needed. This knowledge is acquired through experience, and is often opaque to them. Without it, novices can't grasp what is being taught.

For instance, physics students often have difficulty analyzing a problem because they put it into the wrong category. They analyze the problem in terms of surface features, such as "circle problems," which leads them astray. Physics professors instead categorize problems

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**"I had fallen victim to the "expert's blind spot," the inability of experts to see the problems of novices because they cannot see through the eyes of novices."**

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according to deeper principles, such as "conservation of energy." Often professors teach the mechanical processes of solving a physics problem, but not the prior step of analyzing a situation to apply the correct principles.

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## What Documentary Filmmaking Can Teach Us about Course Design

By Jessica Phillips

What was the last documentary you watched? I'm a big fan of all types: historical, scientific, sci-fi, inspirational, environmental, or mystery. If you haven't watched one in a while, here's a peek at a couple:

- Ancient Aliens: Mysteries of Ancient Construction: ([www.youtube.com/watch?v=VqGT2n4rxo](http://www.youtube.com/watch?v=VqGT2n4rxo))
- America Football (NPR's Radio Lab Podcast): ([www.wnyc.org/radio/#/ondemand/424416](http://www.wnyc.org/radio/#/ondemand/424416))

### Patterns emerge

Having watched a variety of documentary-style films and television shows, I've started to notice some patterns:

- The beginning is key to keeping me interested
- They are filled with stories, often told by the actual people involved
- No single individual talks for very long in one shot, keeping the documentary moving and maintaining variety in the voices used.

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*Online Classroom* (ISSN 1546-2625) is published monthly by Magna Publications Inc., 2718 Dryden Drive, Madison, WI 53704. Phone 800-433-0499; Fax: 608-246-3597. Email: support@magnapubs.com. Website: www.magnapubs.com. One-year subscription: \$219 (Multiple print subscriptions and Group Online Subscriptions are available. Call Customer Service at 800-433-0499.) Photocopying or other reproduction in whole or in part without written permission is prohibited. POSTMASTER: Send change of address to *Online Classroom*, 2718 Dryden Drive, Madison, WI 53704. Copyright ©2016, Magna Publications Inc.

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## Green Screen Videos Made Easy

By John Orlando

Studio shots of a speaker alongside or interspersed with images, graphics, or videos are among the most effective devices for delivering online content. Most of the best educational videos use this method. The speaker provides the information, while the images illustrate it. The speaker grabs our attention, while other content amplifies it. See this exceptional example from the online course *Learning How to Learn*: <http://bit.ly/1LNbRwA>.

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**Watch any good educational video series on YouTube, and you will see a lot of enthusiasm.**

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Such videos are created using greenscreening, the method that TV weather forecasters use to interact with a weather map. The actual background in the studio is a blank screen of a vibrant color that will not be used elsewhere in the video. Fluorescent green is the most common because it is unlikely to be worn by the person in front of the camera and is easy for the software to distinguish from other colors. The shot is taken with an ordinary video camera, but during editing the screen color is removed using a process known as chroma keying. The editor simply picks out the color that is to be removed and tells the software to replace it with whatever else is desired.

Online course can use greenscreening in a variety of ways, most commonly for delivering course

content. Hip Hughes History is an excellent series of YouTube videos created by a high school teacher who uses the method to teach a variety of different topics in history. See an example at <https://youtu.be/yXo9tRB4S3E>. Students can also make videos that explain a concept, quiz the viewer, and provide an account of a historical event, among other things. I have seen people set up models and figurines to shoot animated videos while inserting different backgrounds using greenscreening.

Greenscreen videos are common in MOOCs, but most faculty members assume that they are too technical to be done for the average institutional course. In reality, the process is surprisingly simple, and teachers are making these videos at all levels of education and in all fields. It is common for students to make greenscreen videos in the K-12 realm. With a few pointers, you can make greenscreen videos for your courses.

### Shooting a greenscreen video

It is likely that your film, photography, or marketing department has a greenscreen studio, so the first step is just asking around to see if a studio is already set up at your institution. If not, then you can easily make your own. The screen itself can be purchased online from B & H Photo for around \$60. When choosing a screen, make sure it is big enough to cover not only the subject you are shooting, but also whatever you want to put in on the sides. Screens also come in different materials. While fabric is the cheapest and can be easily folded up when not in use, it is also the easiest to wrinkle, and wrinkles will produce shadows on the screen

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## Continuous Assessments for Better Learning

By John Orlando

**W**e tend to think of assessments solely as devices for measuring learning. But they also influence how students learn because students will tailor their study strategies to their assessments. This means that you need to think of your assessments as teaching devices themselves.

Naomi Holmes at the University of Northampton tested how assessments influenced learning by comparing learning outcomes and student preferences for a single online assessment at the end of a geography course to short online assessments given weekly during the course. The short assessments were mostly multiple-choice questions, though they sometimes involved short answers. Soon after submitting a weekly quiz, students were also given feedback on whether they had answered questions correctly and why.

One major outcome of the study was that students given weekly tests showed improved grades compared to their single-test peers. The percentage of students achieving the equivalent of a first-class or upper-second-class grade in the module went from 54 percent to 63 percent. As a result, a whopping 82 percent of students preferred the weekly tests, while only 6 percent preferred the term test, with 94 percent of students believing that the weekly quiz format improved their learning.

Students opined about the various ways that the continuous assessments improved their learning. A common view was that the quizzes improved the students' study habits by helping them structure their study. The single assessment at the end of the term allowed students to put off studying

to the indefinite future, causing them to lose much of the information that they were given in lectures and readings. Students who were given weekly quizzes were focused on keeping up with material during the course.

Students who took weekly quizzes also showed a marked improvement in their lecture attendance, with the number of students attending all lectures going up from 8 percent to 59 percent. Plus, students taking weekly quizzes were far more likely to review

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**One major outcome of the study was that students given weekly tests showed improved grades.**

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their notes after a lecture. This after-lecture review was critical to learning and something that most students did not consider when the assessment was not looming on the horizon. Some students also said that the quizzes led to spending more time studying overall.

Another finding was that students found the quizzes more stimulating and engaging than the end-of-term assessment. This led them to be more focused during the assessments and to pay more attention to making sure they understood what was taught. It also gave them the feeling of building their knowledge base each week.

Finally, the immediate feedback provided by the weekly assessments allowed students to check their understanding of the material

immediately after being introduced to it, which provided them with opportunities to correct any misunderstandings. The feedback also showed them where they were studying incorrectly, allowing them to revise their study habits as they went along. This meant that students could better prepare for the next quiz, which lowered their overall stress when taking the assessments.

It is easy to set up auto-graded quizzes in online courses. While there are many good reasons for including large assessments such as research papers and projects in a course, this study shows that the online instructor can improve learning outcomes by adding short, frequent assessments throughout the course.

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Holmes, Naomi. 2015. "Student Perceptions of Their Learning and Engagement in Response to the Use of a Continuous E-Assessment in an Undergraduate Module." *Assessment & Evaluation in Higher Education* 40 (1): 1–14. @

### NEXT MONTH'S TOPICS

Applying Neurology to Online Videos

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Document Transfer and Shared Editing Options Compared

Add Competition to Your Online Class with Quizzing

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I know a faculty member who complains that his students do not cite all of their sources correctly, despite being told to “cite this” in the margins of their papers. The professor assumes that students are not paying attention to him. But the problem might be that students do not know when to cite. The professor knows that you do not need to cite common knowledge, such as that the US Declaration of Independence was signed in 1776, but do have to cite information that someone might challenge you on. I can imagine him telling his class that “everything must be cited,” and in the next assignment finding that the students have cited their own names by referencing their birth certificates.

The expert’s blind spot leads many faculty members to separate their most important expertise from what they teach. They teach down to the students’ level and in doing so leave out critical knowledge of their field. It is helpful to think of teaching as a master-apprentice relationship. The apprentice blacksmith comes to the master to learn those things that define expertise in blacksmithing. “The metal broke when you bent it because it was too cold,” the blacksmith says. “It glowed dark red. It needs to glow bright red like mine.” Like the blacksmith, the teacher is cultivating student expertise in the teacher’s “guild,” be it math, physics, or history. Faculty should be teaching students how they themselves as mathematicians, physicists, or historians approach their field.

## Modeling

One way to teach expertise is by modeling expert behavior. Faculty often grade by pointing out mistakes, but leave out information on how to correct them. They might leave the margin comment, “Say more about how social media inform customer relationships,” and nothing more. Students are left to wonder, “What more is there to say?” or, “How do I know when I need to say more?” The comments are like a little league coach saying, “You’re swinging wrong, swing better” to an eight-year-old and walking away.

Faculty can teach students what needs to be included in their work by providing examples of what was left out. The faculty member can say, “For instance, you could talk about how businesses use their Facebook page to respond to questions and complaints to demonstrate their concern for customers.” Now students have examples of what they should have done, which demonstrates the depth of discussion expected. This will help them achieve that depth on the next assignment.

Faculty can also model behavior by demonstrating how they think about a new problem. This can be done with screencasts. Instead of just providing the mechanical processes, faculty members can put themselves in students’ place of seeing a problem for the first time on a test. Faculty can say, “Here, I would first look for . . .” and continue from the first stage of analyzing a problem to proving a solution. This is like my talking through the process of how I drive a stick shift step-by-step. Faculty who do this will likely discover that they use quite a bit more knowledge to solve problems than they assume, and will become aware of the types

of expertise that they are leaving out of their teaching, and what students need to learn.

The same can be done to help students read academic work. Faculty tend to assume that students who leave out material from the assigned readings did not do the reading. But often students do not know how to read academic work. Students read for facts, whereas faculty read for broader themes (Rhem, 2009). A faculty member can address this problem by making a screencast for their class on how they read and take notes on the kind of work assigned in class. Take a look at this example from my own teaching: <https://youtu.be/-JLQ-Q5AsXE>.

Online faculty can also ask students to make screencasts of themselves working through problems or other course material to identify what students are doing wrong. Students can use free software such as Jing or Screencast-o-matic to make the screencasts and post them to a free hosting site such as screencast.com. The instructor can then look at these screencasts to identify mistakes in how students are approaching the problems, and provide advice on how to fix it.

## Teaching pattern recognition

It is also important to understand that much expertise involves pattern recognition. Chess experts do not simply see a chess board as a bunch of isolated pieces. Masters think, “My opponent is using the Spanish Opening,” and respond appropriately. Expertise in chess is developed by acquiring a repository of chess positions over thousands of games. Similarly, medical students are taught how to identify a broken leg in an x-ray by

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## Snapchat for Education

By John Orlando

If the term “social media” conjures up images of Facebook, then you’re two or three years behind the millennial curve. Facebook has been called “your mother’s social media site”; kids post to Facebook to throw their parents off the scent. Today’s students have moved to Snapchat.

Snapchat is an app that allows users to send photos and videos to selected friends. Sounds like Twitter, right? But here’s the twist. The image or video disappears forever 10 seconds after being viewed. The only exception is when the sender puts the images and videos into a “story,” which just lasts for 24 hours.

Over 100 million users send about 9,000 snaps per second, and students view hundreds of “snaps” a day. One study found that 7 percent of college students use it daily.

The value of Snapchat is in its immediacy. If friends are at a bar and a great band has just come on, they can post a video, and others can join them within minutes. While this can be done with other social media, the ephemeral nature of the snaps lend themselves to recording the immediate rather than what is intended to be preserved.

This is partly why Facebook is becoming passé among the younger generation. Young people don’t want a history, and Facebook is built around the concept of recording a history. Timeline images and videos are organized into “albums,” like the dusty photo albums your mother keeps. Snapchat is for the now.

The notion of a system without a history might sound like anathema to higher education, which is fundamentally focused on preserving the past, but the app reminds us that the past is only of value in terms of how it can inform the present. Knowledge needs to be applied to life.

Too often education is assumed to happen within the four classroom walls, and life happens outside. This leads students to wonder about the value of their education beyond getting a degree that will get them a job. If all that matters is the degree, and they can get that with minimal studying and other shortcuts, then why not?

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### Snapchat is for the now.

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Snapchat can help integrate education with life. Adjunct Professor of Psychology at Marist College Michael Britt has been using Snapchat to record examples of the principles he teaches in class as they play out in his life. If he is at a soccer game and realizes that it is a perfect example of deindividuation among the fans, he records a short video to send to his students. He also records himself using systematic desensitization to overcome his fear of dogs.

His students are also encouraged to make their own snaps that illustrate class concepts. Not only does the exercise of drawing up class concepts outside of class help solidify those concepts in their memory, students realize that class concepts apply to a variety of situations in their lives. In other words: the class has value.

This teaching device can be used in most, if not all, subjects. I teach the famous “prisoner’s dilemma” model of social behavior in my philosophy course, and I’m a bike racer. I noticed that the model perfectly explains the strategy employed by riders in races. I can shoot a short video of a race to illustrate.

Certainly, physics instructors and students can make snaps of physics principles applied to the design of parts of the campus. A business instructor or student shopping might shoot a business principle from class as it is being employed by a store. Certainly, those in art classes will find examples of general art forms in use around them.

While students could be required to shoot a certain number of snaps for a course (an instructor can permanently record snaps using screencasting software), it might be better to make the activity optional or ungraded. For one, the point is not to send students out on an assignment related to school. That only separates school from life. The point is to get students to stumble across teaching concepts during their everyday activities. This helps students see the integration of education with life. It may be that students on the lookout for snaps related to one course start seeing how topics covered in their other courses play out in life.

Finally, the story function provides the opportunity for students to group series of snaps into a narrative. Maybe students on athletic teams traveling for a competition put together snaps around organizational behavior issues covered in their business administration course.

Learn more about Snapchat at <http://bit.ly/1Aozl1P>, take a look at this quick tutorial on how to use Snapchat at <https://youtu.be/PghzjXawP4I>, and learn how Michael Britt is using it at <http://n.pr/1PDIXLa>. Finally, consider using this resource in your courses. @

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being shown a number of x-rays of broken legs, along with a number of x-rays of unbroken legs. At first they cannot see the difference, but over time they develop an eye for distinguishing a broken leg from an unbroken leg.

Faculty can help students develop pattern recognition by showing them multiple examples of a principle applied in different cases. Whether it is a literary theme

appearing in different works, or a marketing principle appearing in different ads, students will develop an eye for seeing it by looking at examples across different contexts.

Teaching is about cultivating expertise in students, and that means teaching the hidden knowledge that defines expertise in your field. Find ways to show your hidden knowledge to students, and you will soon be seeing vast improvements in your their understanding and work.

## References

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- They often ask reflective or probing questions along the way that both get us thinking and give us a hint of what's to come
- They let the story unfold through slow revelations
- They have multiple perspectives (the expert, the narrator, the novice, multiple people involved who may see things from different angles, etc.)
- These multiple perspectives engage or are edited together in a sort of choreographed dance
- Music often plays a key role in setting the tone
- Emotion is often intentionally stimulated through visuals, sounds, and stories

Once I started to identify these patterns, I realized that these elements are there to help the film's message sink in. Through engaging the audience, stimulating emotion, presenting stories from multiple angles, and providing perspectives the audience can relate to, the film can effectively hit home. But wait, isn't this exactly what we should want to do in our courses? Don't we want to create learning experiences that engage and stick? The answer is yes.

## Leveraging strategies for course design

So how can we apply the same strategies that documentary filmmakers use to create vivid and relatable experiences?

- Gain interest in or buy-in to the course from the very beginning and within each week or module. This might be through sharing a story, an emotion-igniting image (with descriptive text), a sound bite/podcast (with transcript), or a video (with captions). You might start with a question that sparks interest and ignites the students' curiosity.
- Include multiple perspectives in the course content and course videos that your students can relate to. Perhaps when presenting a topic you can have several "voices" (whether via video, sound, graphics, or text) that share different views or add to the completion of the puzzle.
- Consider the variety of knowledge types and skill levels in your classroom. By incorporating a novice, expert, and narrator into your content, you can give students who are confused someone to grab onto (the novice), someone more advanced for the advanced students (the expert), and someone who can bring it all together (the narrator).

- Ignite emotion through images, sounds, and stories about the concept. For instance, perhaps an engineering class could find itself driven by a futuristic story of a problem that must be solved to save the earth.
- Give students a chance to stop and reflect in a discussion forum or in a journal. This will give them the chance to think about their impression of the content, its value and meaning, and what might be ahead.
- Provide teasers that hint at what's ahead, but don't reveal too much. Maintain some mystery and intrigue.
- In course videos, try to incorporate multiple voices. You might even stage and film a mini-talk show of sorts (perhaps of *The Daily Show* variety) and get several voices talking about the topic from several angles.

By implementing some of the same strategies found in documentary-style filmmaking, we can more deeply stimulate and intrigue our audience, thereby increasing their buy-in to the content.

*Jessica Phillips is a senior instructional designer and strategic initiatives coordinator at The Ohio State University. @*

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that may not come out in the video. So it might be worth paying a bit more for a wrinkle-resistant screen. You can hang whatever you get with PVC piping at the top and bottom to pull it flat. If you have a permanent place to shoot your videos, you might want to consider painting a wall with Behr's Gamma Sector Green Disney Color paint, available at Home Depot and designed for greenscreen shooting.

Next, make sure that your subject is well lit. The goal is to remove all shadows. The ceiling lights in a classroom might be sufficient, but if not, start by having a light in front and on both sides of the subject that cross to remove shadows. You will also likely need a second set of lights behind the subject focused on the screen itself to remove shadows created by the subject. Another good idea is to put a light above and behind the subject facing forward. This will create a nice white outline around the subject, rather than the harsher black border that is often produced without it. See a good video of greenscreen hints from TechEducator here at <https://youtu.be/J-IgxuLHGo>.

Because the video used for greenscreening is no different from ordinary video, any digital camera can shoot it. You should use something with high definition because the blurriness of low definition is distracting. Even a good webcam such as a Logitech C930 HD 1080p will work. You definitely want to put the camera on a tripod to eliminate shaking. The small area of the shot means that the subject is not going to move around, so the camera can be fixed in place. The video editor will use panning during the editing process to reposition the subject in the frame when any elements are added on either side. You might also want to turn off

the autofocus on the camera and instead set the focus manually so that it does not try to focus on the screen, rather than the subject.

Finally, it is critical to get your audio right, as people will quickly turn off anything with poor sound quality. Hang a sign on the door of the room where you are shooting to warn people to not knock or walk in. Make sure to watch for the hum of air conditioners or heating vents. A good camera-mounted microphone will work, but better sound quality can be obtained from something closer to the subject, either a handheld microphone, or better yet, a lapel microphone.

### **Stylistic considerations**

Understand that you will likely shoot a number of takes before you get a clean version, so try not to get frustrated. It will take time. You can use cue cards for notes, but unless you have a teleprompter, you don't want to write out the speaker's narration word for word because it will be obvious that the speaker is reading from a script off to the side. Just put a few notes on the cards in outline form and use them like you would use notes in class.

A central tenet of shooting videos is enthusiasm. Most people get nervous when being recorded, and they slow down their speech and employ a monotone. This makes you look bored, which will cause your viewer to get bored. Watch any good educational video series on YouTube, and you will see a lot of enthusiasm. Remember that the content is interesting and meaningful, so demonstrate that in your manner and voice.

### **Editing**

Greenscreening requires video editing software that comes with chroma key functionality. One of the cheapest and easiest to use is Do Ink, a \$5 iPad app. With Do Ink, you can use the iPad both to shoot and

edit the video afterward, providing an all-in-one option. The app is simple to use and produces decent quality at a low price. See this video: <https://youtu.be/LWAHxtpPp24>.

TouchCast is another iPad app that I covered in a previous issue (October 2014). TouchCast allows you to make videos with interactive pop-up elements such as documents, webpages, quizzes, and Twitter feeds inside the video frame. It comes with chroma key functionality and offers an \$80 "Studio in a Box" setup with a greenscreen, lapel mic, iPhone and iPad holders, and miniature tripods to shoot your videos. See [www.touchcast.com/studioinabox](http://www.touchcast.com/studioinabox).

iMovie for Mac also comes with chroma key functionality, as does Camtasia Studio, which I use because of its many functions. This video on using chroma key editing in Camtasia Studio has helpful production tips and covers processes that apply to most video editors: [www.techsmith.com/tutorial-camtasia-8-remove-color.html](http://www.techsmith.com/tutorial-camtasia-8-remove-color.html).

Finally, if you can get your instructional designers or film department to help, they will probably already use a higher-quality video editing system such as Adobe Premier or After Effects, both of which come with chroma key functionality. I find that these people are generally chomping at the bit to show off their video editing expertise when asked, so you might be able to get someone else to do all of the editing for you.

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Tech Educator Podcast. 2013. Everything You Have Wanted to Learn about Green Screens, Lighting, Cameras |TechEducator Podcast, YouTube video, 1:03:01, posted by Jeffrey Bradbury, August 11, 2013. <https://youtube.com/watch?v=J-IgxuLHGo> @

## Benefits of Video Discussion

By John Orlando

The traditional Learning Management System discussion forum is the go-to method for hosting online student discussion. However, faculty members need not limit themselves to text discussion. Widespread access to video recording systems makes video discussion a realistic alternative to traditional text discussion.

Cynthia Clark, Neal Strudler, and Karen Grove of the University of Nevada, Las Vegas, experimented with using student videos for discussion in their online courses. Students used webcams to record themselves making comments that they would have made in text discussions. Because their LMS discussion forum did not support video, they used the Hangouts function in Google+. Students first signed up for a free Google account, which includes Google's services. The researchers also set up a Google account for the class itself. The students were then put into a "circle" for the class, which is how Google+ makes private groups.

From here, the instructor posted a discussion prompt on the class page. Students replied by recording themselves on their webcams using the Hangouts feature in Google+.

The researchers found that video discussions increased social presence in online courses. "Social presence" is the ability of online participants to project their personal characteristics to others to show themselves as real people. Social presence helps counteract the isolating effects of online education and makes students more likely to stay in a course.

Students expressed their feelings of increased social presence in post-course surveys and interviews. One student said that the video

discussions "made you feel like you're in class instead of just being online." Another noted that something in the background of one student's video prompted the student to ask the speaker about it, starting a conversation that better connected students to one another.

Instructors also posted videos of themselves discussing concepts, which helped connect the students to the instructor, creating "teaching presence." One student noted that she "got a better feel" for her instructor when the instructor posted videos rather than text

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**The researchers found that video discussions increased social presence in the online course.**

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comments. This is in line with findings that voice commentary allows listeners to pick up nuance better in speakers' messages.

Google+ Hangouts is also useful for hosting live events. The person speaking fills up the main screen, with the video feed of other participants at the bottom of the screen. Plus, it is easy to show a YouTube clip in the main window, whereas most live meeting systems have difficulty with video due to bandwidth issues.

Hangouts is also an excellent tool for recording screencasts. An instructor who wants to demonstrate a process, such as how to navigate a website or how to create a function in Excel, can simply record their screen while walking through it on Hangouts On

Air. The result will automatically post on the instructor's YouTube account, which can be linked to the course. The Hangout can also be downloaded as a video file to be hosted elsewhere. This is also a good method for students to use when creating screencasts explaining digital projects they have created.

The one drawback of Google+ is that there is no easy way for students to post video replies to other student videos. Once a student has posted a video, other students reply by text in the comment function beneath it.

If you would like to have students post a series of videos as a discussion, then your best bet is hosting it on VoiceThread. The instructor can seed a discussion by creating a single-slide VoiceThread with video comment. Students can then post their own video replies that run down either side.

Take a look at this tutorial on how to use Google+ to host video discussion as well as record screencasts and live events at <http://bit.ly/1GkJrXY>. Consider adding video discussions to your online courses to improve student engagement and presence.

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