

Community of Inquiry and Video in Higher Education:  
Engaging Students Online

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## Abstract

The purpose of this literature review was to explore how video technology can be effectively used in an online classroom setting. The author found and cited online journals with information about the Community of Inquiry (CoI) framework. He further explored specific sources that could give readers an idea how online video technology can affect each of the three elements of the CoI framework. These three elements are cognitive presence, teaching presence, and social presence. This literature review also contains information about the overall impact of online video technology on higher education as well as strategies to implement video in online classrooms. Results indicate that due to the sheer masses of educational online videos, sifting through them to find relevant and accurate content will remain a challenging task for instructors. The literature further indicates that it is highly advisable to build a course design around the use of video instead simply of exposing students to videos without an accompanying strategy in mind. One fact though does become clear: Online video technology helps with establishing a social presence for both the instructor and the student. Educators could potentially further investigate the impact of online video technology in relation to the community of inquiry. There is already enough literature in existence that would allow another researcher to explore these issues in more depth.

*Keywords:* community of inquiry, online classrooms, student engagement, online video technology, higher education, learning community, social presence

## INTRODUCTION

There are many reasons why video becomes an essential part of online education. These reasons are interconnected, since they involve overcoming the feeling of isolation in an online setting, forming an online community, and the importance of technology in bringing students and instructors together in synchronous and asynchronous classrooms. Online education is not usually designed with the purpose of keeping people separated, but with the goal of engaging students that are sometimes hard to reach because of their income level, work-life balance, and other personal reasons. The obvious effect of people being physically separated in online education can ultimately result in a number of issues. Students may feel disconnected with either the material that is being taught, their fellow students or instructors, or they may not identify with the program altogether. This leads to negative side effects such as lower student engagement (Kahn, 2008), lower student performance (Pascarella, Seifert, & Blaich, 2010), and higher dropout rates (Yasmin, 2013).

To counteract these negative side effects of online education, video has proven to be a good solution for a variety of reasons. It engages learners and helps them connect with one another. The learner is exposed to real human faces online, which ultimately leads to a higher fidelity and can also help with establishing a sense of community. Fidelity counteracts the feeling of isolation in an online environment since video has the ability to expose viewers to the faces of real human peers in the classroom. Learners also often complain about the missing sense of community online. There is no personal student interaction before or after the lesson, no body language or facial expression that

can be noted while interacting with peers. Therefore it is even more important to bring this element of humanity back into the classroom – with video.

There are several different options for how this can be achieved. One of the possible solutions is a tool called VoiceThread. This software allows participants to have discussions online by posting videos of themselves on presentation slides that are hosted and accessible in an online application. Students not only see each other's videos and their opinions on certain subject matters and assignments; they can also have discussions and follow up with one another by posting videos, audio recordings, or text.

Another option is to facilitate online meetings via video conferencing, which can be achieved with tools such as WebEx, Adobe Connect, or GoTo Meeting. These applications allow participants to enter a virtual environment in which their images are displayed side-by-side on a video wall. Here again, the advantage lies in the added element of improved human interaction, since participants can see each other's facial expressions.

A third strategy that helps online instructors make use of video is the flipped classroom model. In this strategy the instructor has either the option to screen record a lecture prior to a seminar or online meeting, or the instructor could choose to simply make a video available for students to watch. This video content becomes the basis for a classroom discussion and the learners are already primed with a topic.

Last but not least instructors can also choose to have video content generated by students using the “Digital Storytelling” (DS) method. In this form of teaching the instructor assigns students to go out and record audiovisual content themselves or create short videos using online applications such as PowToons. PowToons is a free online

animation application. DS is slightly more involved as it requires students to be tech savvy since they have to be able to edit content themselves. However, using this content is a great way to engage students because it is a good alternative to the traditional method of having them turn in regular written assignments.

The strength of these strategies is that the instructor has the option to combine these methods. The instructor for example could combine two of these strategies by assigning students to create a PowToons animation and then upload this file to VoiceThread. This way the students would not only be engaged in creating this animation, they would also be able to see and comment on each other's work.

### **Research Questions**

The purpose of this literature review was to investigate how the effective use of video in online classes can improve student engagement in higher education. The following questions were explored:

1. What is the impact of online video technology in higher education?
2. What is the impact of online video technology on student engagement?
3. Does online video technology increase the likelihood of building a community of inquiry?
4. What is the impact of video on each of the three elements of the Community of Inquiry?
5. What are the components of effective video technology in online classrooms?

The researcher began his literature review by investigating how instructors can make use of video to provide feedback. In looking at how traditional brick-and-mortar (BaM) classrooms used to operate, the teacher was usually able to provide immediate oral

corrective feedback. This immediacy is not often present due to the asynchronous nature of many online programs. It is important to take the immediacy of feedback into consideration when designing video strategies in the online classroom (Kahai, Jestire, & Huang, 2013). Interactivity was another area frequently mentioned in the literature and this is one of the great advantages of using video since there are always play, stop, pause and rewind buttons for the learner to use. But these simple functions of a video player really only touch the surface of this complex topic. One of the most important aspects frequently presented in the literature on using video in classrooms was fidelity. With this higher amount of fidelity the instructor has the ability to establish an online presence. Social presence is one of the three pillars of the CoI, also frequently mentioned in scholarly literature on online education. The other two pillars are teaching presence and cognitive presence.

### **Rationale**

There are a lot of faculty members who are generally not interested in teaching online because they believe the quality of online education is inferior to Brick-and-Mortar (BaM) education (Inside Higher Ed, 2014). Utilizing technological tools and applications to facilitate content in a more interactive manner is in certain cases seen as unnecessary extra work and sometimes university administrations do little to incentivize more use of instructional technology (Inside Higher Ed, 2014).

More and more academic classes are delivered online. The online component requires university administrations to adapt their online learning strategies and focus on how to optimize the quality of online classes. With the shift from BaM to online, new

challenges emerge for administrators and faculty to help students construct and retain knowledge.

### **Definition of Terms**

The researcher included definitions to make the content of this review more relatable. Each definition was taken from current reliable peer-reviewed sources.

**Community of Inquiry.** The CoI framework describes modern online education with three interdependent elements (Oyarzun & Morrison, 2013). These three elements are social presence (SP), cognitive presence (CP), and teaching presence (TP).

**Social Presence.** Social presence is described as “the sense of being there” (Elwood, McCaleb, Fernandez, & Keengwe, 2012, p. 240). The more online participants are able to establish a social presence, the better the quality of the online discourse becomes.

**VoiceThread** is a free online tool that allows instructors to facilitate asynchronous online interaction (Koricich, 2013). Upon uploading slides students and instructor have the ability to have a multimedia discussion by posting onto these slides with video, audio and text responses.

**Digital Storytelling** combines pictures, sounds, and text into short “personal presentations” (Sukovic, 2014, p. 206). In the context of video in the classroom that means that students go out and write scripts, film interviews, and create content by utilizing video editing systems such as Adobe Premiere or Apple iMovie.

**PowToons** is a free online application that students and instructors can use to upload their own images and sounds to animate them and export them to movie clips

(Holzweiss, 2014). Animation paths can be manipulated via a timeline, which is common for most multimedia authoring applications.

## **REVIEW OF RELATED LITERATURE**

This literature review focused on five main areas to provide the reader with the necessary background information. The first area was the impact of online video technology on higher education, which provided the reader with a concise overview of online video technology and where it stands today. This is especially important to mention because online video technology can act as a vehicle or trigger to promote student engagement. Student engagement in higher education was the second area of focus in this review and it is very important since it leads to very positive side effects such as more self-confidence, better grades, lower dropout rates and more knowledge-retention. To put it concisely, student engagement remains one of the keys to successful education. Engagement was interconnected with the third area of focus, which is how instructors can use online video technology to build a community of inquiry. The idea of a community of inquiry is also to drive student engagement and therefore it was important to include literature on how video can help to establish such a community in an online classroom. The fourth area of focus of this literature review contained information about the impact that online video technology has on each of the three elements of the community of inquiry framework. The literature review concluded with the fifth area of focus and contained information on the components that go into effective online video technology.



## **The Impact of Online Video Technology on Higher Education**

Internet access is really not a concern among the millennial student generation as Park et al. (2014) mentioned. Park and his team stated that most college students in the US today have access to broadband Internet and therefore faculty do not have to be concerned about students being able to access online materials. One of the most important driving factors behind video in online education is the influence of YouTube (Zahn et al., 2014). Looking at the numbers YouTube usage overall seems to be exploding, with YouTube claiming that 365,512 videos are uploaded every day (Soukup, 2014). These large numbers can also be disadvantageous. Since there is a mass of videos now flooding the Internet it can be difficult for faculty to decide which videos to integrate in their courses (Sherer & Shea, 2011). One has to look at these numbers carefully since YouTube is an open platform where anyone can upload and host videos. It is important to note that another version of YouTube exists, which exclusively hosts video targeted to instructors and students – YouTubeEDU. According to the company, “YoutubeEDU is a free and self-organizing, democratic website containing all the world’s knowledge” (Gilroy, 2010). Chen and Gilchrist (2013) pointed out one of the best-known downsides of the Internet: when the learner tries to access information on a platform that allows anyone to post content, this content cannot be validated for accuracy. Sherer and Shea suggested that faculty search in online video databases that were specifically designed for instruction such as “TeacherTube”. Such databases are important for faculty so that they can find relevant videos easily.

Field trips were often used to give students real-life experiences in brick-and-mortar institutions, so now there is a gap since many educators decided to shift to an

online format (Roehl, 2013). In her study, Roehl tried to “bridge the field trip gap” because she identified a need for a strategy to expose students to industry professionals without having to invest time and money. Roehl decided to video record interviews with interior design professionals and make these videos available to students on a custom-designed website. Her study revealed that an impressive 44.9 % of millennial students preferred video as a media option to articles, magazines, textbooks, and PowerPoint lectures. This is no surprise since Batra, Marcketti, and Ratute (2011) gathered research on the matter with similar findings. These researchers polled students and the results indicated that the majority of students preferred videos on DVD and YouTube over PowerPoint. However it remains unclear if these studies are representative of the video preference of students in general, since the information was gathered with interior design students who are arguably more visually inclined than the average student.

Olofsson, Lindberg, and Stöberg (2011) looked into how educational technology could be enhanced by video. Olofsson et al. conducted an experiment in which they utilized Voice Thread as an instructional tool. VoiceThread is a free online tool that allows instructors to facilitate asynchronous online interaction (Koricich, 2013). Upon uploading slides students and instructor have the ability to have a multimedia discussion by posting onto these slides with video, audio and text responses. While the researchers could not clearly state what type of impact Voice Thread had on classroom discussions they concluded their study by suggesting further research on the matter (Olofsson et al., 2011).

## **The Impact of Online Video Technology on Student Engagement**

In an attempt to understand the implications of video as a tool for teacher education, another team of researchers gathered information on how video needs to be used in order for it to be effective (Blomberg, Sherin, Renkl, Glogger, & Seidel, 2014). These researchers stated that video by itself is not effective because it has to be used in the context of an instructional program. In their study Blomberg et al. (2014) explored how video can embed the four-component instructional design system model (4C/ID) and situative learning (SL) strategies. The four components of the 4C/ID model are “part-task practice”, “whole-task practice”, “supportive information” and “just-in-time information” (Mariënboer, Clark, & Croock, 2002, p. 40). The 4C/ID model is based on the theory that a learner shouldn’t be overwhelmed with an excessive cognitive load and the SL model confronts the learner with a more complex problem to solve (Blomberg et al., 2014). Blomberg et al. confirmed that video should be used as a tool in a broader instructional context and not by itself. For the 4C/ID approach, students were provided with more guidance. During the experiment with the SL group, a video was played in the beginning and students reflected on the content of the video afterwards. The researchers stated that SL is better for fostering long-term reflection and cognitive approaches are better for expert like reflections over a short time period (Blomberg et al., 2014). The researchers also made a distinction between which videos were selected for the different 4C/ID and SL groups. The 4C/ID group had more videos containing scaffolded newly introduced concepts, whereas the SL group was exposed to videos that included a “learning atmosphere” (p. 449). This study shows that there is a benefit in aligning the content of a video with the overall teaching strategy of a course.

Nevertheless, students need to watch the video content that they are exposed to. While it helps instructors to have administrative access to the video streaming service where the instructional videos are hosted to determine which student watched which content, this data doesn't necessarily provide information on which content was particularly engaging. Engagement, however, was a positive qualitative finding in the study of McLaughlin et al. (2013). McLaughlin and her team concluded that most of her students found prerecorded lectures engaging.

### **Building a Community of Inquiry with Online Video Technology**

Over the last decade more articles have been written about the Community of Inquiry (CoI) framework. The CoI framework describes modern online education with three interdependent elements (Oyarzun & Morrison, 2013). These three elements are social presence (SP), cognitive presence (CP), and teaching presence (TP). There are many articles about the concept itself, but there are also other articles that take the student's perspective into consideration. Garrison, Cleveland-Innes, and Fung (2010) showed how students perceive the model in practice. These authors wrote an interesting survey that measures the effectiveness of each of the three elements of the community of inquiry framework: cognitive presence, teaching presence, and social presence. The result of this study was that TP plays a significant mediating role between SP and CP. Sung and Mayer (2012) wrote about SP in particular. These researchers were interested in what social presence really is, what the factors are that make students perceive others as more real, and how these factors influence social presence. Sung and Mayer concluded that there are five factors of SP: "social respect, social sharing, open mind, social identity, and intimacy" (p. 1744). Remesal and Colomina (2012) wrote about social presence as a

socio-constructivist approach. These researchers discovered in their study that a group is “represented in the individual’s minds” meaning that social presence might be an individual and not a group construct (Remesal & Colomina, 2012, p. 365).

Lee E. Weyant (2013) wrote about a course he designed based on the CoI framework. Weyant took a similar approach to Garrison, as he wanted to “focus discussion from a real-world perspective that students can relate to”. In his course, Weyant decided to have his student explore a business simulation, which related to the situative approach from Blomberg et al. (2013). Blomberg et al. (2013) had a good approach in their study by at least trying out two different learning theories in their experiments on online video technology. Ultimately this could mean that cognitive presence within the CoI framework indicates that selection of materials and course design should never be arbitrary. This also applies when selecting videos for a course.

### **The Impact of Online Video Technology on the Community of Inquiry Framework**

The author established earlier in this project that the CoI framework consists of social presence, teaching presence, and cognitive presence. Social presence is the presence of the learner, teaching presence the moderating presence of the instructor, and cognitive presence describes the meaning-making of the learner.

#### **Online Video Technology and Social Presence**

There are many different ways that video could be utilized in the online classroom. An important factor is the effect of social presence in a virtual classroom. Homer, Plass, and Blake (2007) looked at the effect that educational videos have on

social presence and cognitive load. Their study showed that using video increases the cognitive load on the learner. The researchers concluded their article by saying that video usually helps “high visual-preference” learners and only increased the cognitive load on “low visual-preference“ learners (Homer, Plass, & Blake, 2007, p. 786). This is one of the many instances in literature on education that clearly proves that not all learners are created equally. Another way video could be used in an online classroom is videoconferencing. Lowden and Hostetter (2011) examined the relationship of social presence and videoconferencing. These authors argued that while videoconferencing doesn’t provide the level of social presence that face-to-face meetings do, it is an “adequate” alternative (Lowden & Hostetter, 2011, p. 382).

### **Online Video Technology and Teaching Presence**

One of Garrison’s peers is Jared Borup, who continued to examine video in the context of the CoI. In his 2014 article, which was co-authored with three colleagues, he focused more on the “instructor social presence”, which is similar to the teaching presence in the CoI model (Borup, West, Thomas, & Graham, 2014, p. 234). The researchers examined if students perceive a higher instructor social presence if they received the feedback via video. In their findings the researchers stated that it was easier for the instructors to convey emotions on the one hand, and on the other hand it was easier for the students to perceive emotions through video feedback. This really came as no surprise since facial and body expressions are much more human than emoticons in a written feedback.

## **Online Video Technology and Cognitive Presence**

It is easy to draw the conclusion for both social and teaching presence in the CoI framework that video helps counteract isolation in online environments. It is more difficult to determine the effects video has on the third element of CoI: cognitive presence. Looking back at Garrison's original research of what his team meant by cognitive presence, it becomes clear that it's not simply the idea of critical thinking in higher education (Garrison, Anderson, & Archer, 2010). In another study from 2010, Garrison and his team stated that cognitive presence does not include only critical reflection of content. It also concerns defining a problem, exploring relevant information, constructing knowledge, and then finally elaborating on possible solutions (Garrison, Cleveland-Innes, & Fung, 2010). How does this complex process relate to using video in an online classroom? The answer relates back to Blomberg et al. because their research showed that video by itself is not as effective, rather it has to be accompanied by an effective instructional course. This could potentially link the cognitive presence in online video technology to effective course design.

### **The Components of Effective Online Video Technology in Education**

There are two important aspects that should be investigated in the context of online video technology. The first aspect is the implementation of this technology in an online education environment and the second aspect is the course design that is built around the use of online video technology. One current concern is the fact that it is helpful to have videos play back directly in the browser window. The fewer steps are involved to give a student access to viewing a video the better the implementation works.

For this fifth area of the literature review the researcher has taken four elements into consideration: feedback, interactivity, fidelity, and learning transfer.

### **Feedback**

Feedback in the online classroom works in two directions. The feedback can either be directed at the learner when for example the instructor gives a student feedback on an assignment. When feedback flows from the learner to the instructor, the instructor can use this feedback to optimize his or her instruction technique, philosophy, and materials.

Li (2014) described what is widely known as “oral corrective feedback” (OCF) (p. 1). This is the technique that is most widely used by many teachers around the world for providing immediate feedback to students. Li (2014) argued that the teacher should ideally first prompt the learner to come up with the correct answer on his or her own. Then, in case this is not successful, the teacher provides the learner with the correct answer. This technique is commonly known as “prompt-then-provide” (Li, 2014, p. 2). Since this technique is commonly used in brick-and-mortar institutions, it is interesting to see what the current literature suggests for online education.

Parr (2014) considered an example where faculty in the United Kingdom (UK) used screen-capture technology while correcting papers (p. 1). These lecturers recorded their explanations along with parts that they highlighted on-screen to give students feedback. The lecturer stated that even though initially more time-consuming, when this technique is practiced it could end up saving time for the instructor (Parr, 2013). Evans (2013), just like Li (2014), argued that feedback in education is valuable as it also provides a teachable moment for learners. Evans (2013) noted that over the last 10 years



an important theme has evolved, which is the “effectiveness of e-assessment feedback” (EAF) (p. 85). Evans defined EAF as feedback that is provided through communication technology (Evans, 2013). Studies also show that students gain more learning from this feedback when it is provided from an expert (Evans, 2013). This could be interpreted to mean that expert feedback is more valuable than peer assessment.

Albertson (2012) focused on “feedback in interactive video retrieval”. He was interested in the difference between “user-requested feedback” and “user-provided feedback” in video based libraries (Albertson, 2012, p. 502). His findings showed that user-provided feedback in a video library is insignificant in comparison to user-requested feedback (Albertson, 2012). Crook et al. (2012) stated that feedback should not be given too late. Crook et al. further wrote in their study that online video technology enhances the quality of the feedback. This can be seen as an indicator that video as a medium for student feedback is more efficient than written feedback.

### **Interactivity**

Interactivity in video is about empowering the learner with choices. Watching an interactive video means that the viewer has the choice “of what is to be viewed next” (Stenzler & Eckert, 1996, p. 76). Stenzler and Eckert introduced five levels of interaction that the user experienced while watching an interactive video. The measure ranged from one to five, with a one representing the least interactive to a five representing the most interactive. Alotaibi and Fayyoubi (2014) confirmed that interactive functions around videos are more effective and stated that smart e-learning should provide students with a search function that allows for faster and easier learning. According to Rasch and Schnotz, “interactive pictures result in lower learning than non-interactive pictures”

(2009, p. 420). The author's research was so detailed that they made very clear distinctions between what types of learning works better with interactive pictures (Rasch & Schnotz, 2009). In general, interactivity might not have an impact on the learning outcome but on the process of learning itself (Rasch & Schnotz, 2009).

When one writes about interactivity in the context of video in higher education it is important to mention the "learner-learner interactivity" in virtual environments (Smyth, 2011, p. 124). The researchers argue that face-to-face interaction in virtual environments counteracts isolation and helps learners to give each other support. One of the key business decisions that made YouTube so successful was the additional social media function. With the option to post video responses, YouTube hit a nerve with millennials. This function is now widely used and is the foundation for success for many YouTube media bloggers. Academia has the chance to harness this potential by bringing the video blogging element to the classroom as Cooley, Holland, Cumming, Novakovic, and Burns (2013) explored in their study. Since video blogging is a similar process to keeping a video diary, these researchers explored the possibilities of a video diary room in a study with a class of engineering students. In their study Cooley et al. stated that video could improve the clarity and quality of student feedback since students are given the opportunity to respond in a more private and direct manner. YouTube is currently a user-friendly platform that can be used by students to post video responses. Zahn et al. (2014) found in their study that YouTube is a good platform for teaching students successfully.

## **Fidelity**

Fidelity in online video usage is important because it counteracts feelings of isolation as Borup, West, and Graham (2012) discovered. Borup et al. (2012) argue that the fidelity of video can help overcome the issue of isolation and give the learner a feeling of social presence. This research showed a clear result; video can help establish the instructor's social presence (Borup, West, & Graham, 2012). Social presence is one of the three elements of the Community of Inquiry (CoI). Although sometimes fidelity isn't always the best answer as Norman, Dore, and Grierson (2012) summarized in their work. Norman et al. concluded "the level of fidelity does not translate to learning" (2012, p. 645). Cui, Lockee, and Meng (2013) wrote a paper that focused mostly on social presence, but also mentioned "interactivity". Interactivity, as Cui et al. mentioned, is one of the parts of social presence as it helps users navigate online.

## **Learning Transfer**

Many themes emerged in the literature on learning transfer. Hung (2013) believed that during learning transfer previously learned knowledge is applied and used to complete a new task. In the context of learning transfer there are different subdivisions that all tie back into the broader context of learning transfer. Among these are transfer obstacles or barriers and different categorizations of transfer, for example, the difference between near and far transfer. Hung further stated that in the context of separate learning transfer barriers there are differences between theoretical concepts that are newly introduced and the actual application of these new concepts. Another barrier might be a psychological dependency that students might form on the instructor (Hung, 2013).

There are many different types of learning transfer. Starting with Near Transfer, which describes the concept of a very close relationship of a newly introduced concept and the application of this concept (Kaminski, Foley, & Kaiser, 2013). Far Transfer on the opposite side of the spectrum describes a situation where the newly introduced concept and the application of the concept lie further apart. Kaminski et al. (2013) described an example where the newly introduced concept would be how to bake an apple pie and the application of the concept would be if the student would then try to bake 100 plum pies. There is a need for further research on what the implications of learning transfer on online video technology are, but these implications might tie back to teaching strategies and cognitive presence.

### **Discussion**

Looking at this literature review there are a few key aspects that emerged in the context of online video technology and the CoI framework. It is important to note that there are masses of instructional videos in existence and the number of available videos is rapidly growing. While there are websites available such as Lynda.com and Khan Academy where quality video material is available for instructors to sift through and use, there is still a need for someone to check video content for relevancy, perhaps video database vendors or librarians. The use of video content cannot be arbitrary in course design and it is up to the instructor to check the video content for accuracy and applicability. The research points out many strengths of online video technology for higher education and instructors have to design courses where the videos are grounds for classroom discussions that facilitate learning. This is why video cannot be seen as a

solution that works by itself, but as a tool that has to be looked at in an instructional context.

Timeliness of feedback makes online video technology more effective. Whether this feedback is given from a peer or an instructor it should be prompt. Social media provides a powerful solution to keep the flow of feedback moving. And since social media can be accessed in certain settings by the entire class, it has the potential to help student's learn from each other.

Two areas that leave room for further research are the implications of online video technology for visually inclined students versus non-visually inclined students. The other area would be to measure how online video technology can facilitate learning transfer in particular. One fact though does become clear: Online video technology helps with establishing a social presence for both the instructor and the student.

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