

Application Summary

Application Details

Proposal Title

Virtual Reality in Law and Ethics Online Teaching

What are the desired learning outcomes for your students and what learning gaps have you identified?

My proposal is to expand my use of Virtual Reality and immersive video to increase student success and engagement in my online business law and ethics courses. By creating more compelling content and presenting it in an immersive manner, I aim to reduce distractions and increase enthusiasm for the course material.

I have taught online classes at the University of Iowa Tippie College of Business since 2010. These classes include Nonprofits, Intro to Business Law, and Law & Ethics for MBA students. I have also worked on multiple online teaching committees, including the Online and Distance Education Strategic Planning Committee. Our online offerings at Tippie have gone from a few classes with rudimentary technology, such as I taught in 2010, to a fully online MBA launching next year and many undergraduate courses.

Although the production value of the course videos and content has improved immensely in the past 8 years, unfortunately, I see much lower student engagement in my online courses today. Students in 2010 considered it amazing that they could watch a two hour lecture from the comfort of their home. Many were non-traditional, older students who were enthusiastic about earning or finishing a business degree from locations all across Iowa. These students were grateful to have online learning as an option, and generally were more engaged in their coursework than their on-campus peers, in my experience.

After participating in an external review of the University College and the Division of Online Education last year, I learned that today's online students are much more likely to be traditional, college-aged students who reside on or near campus in Iowa City. They are taking online classes as a preference over on-campus classes in order to get more flexible scheduling or to balance college with a job.

Perhaps because online learning is no longer a novelty, but is now an expectation, I find my online students today to be less engaged, less enthusiastic, and less diligent in completing assignments. The mean final exam score for my Summer 2018 online Intro to Law class was 67%, while the mean score for the same exam in the on-campus class, Spring 2018, was 73%. Scores on other exams and assignments follow the same pattern. There may be some self-selection bias at play, with less motivated or busier students choosing the online courses. However, I also believe that the many distractions available to online students are contributing to lower student success. Many of the communications I receive from students, as well as online course evaluations, indicate that online students are not carefully viewing the video lectures and content, and are unenthusiastic about boring, flat lecture videos.

Thus, the main learning gaps I have identified are increased student distraction, and lower enthusiasm for traditional online video lectures.

There is a plethora of research arguing for different methods of online teaching to address the lack of student engagement. For instance, DOE advocates that no video lecture be longer than 5-7 minutes, because students have short attention spans today. Also, DOE does not support the use of actual video taken in a classroom setting, but rather in a studio setting against a black wall, to give a more consistent look. However, these recommendations conflict with decisions we made at the University level online strategy committee, where we decided that online classes should look and feel as much like on-campus classes as possible. It is highly unlikely that the University will move to 5-7 minute lectures for on-campus classes. Also, we do not go to the theater to see a 5-7 minute movie, or to a stadium to watch a 5-7 minute football game. I would argue that the attention deficit problem is not produced by the quantity of video, but the quality. I would also argue that watching a small, stationary, "talking head" video of a professor creates boredom and makes students much more likely to submit to distractions, such as social media or web browsing.

I had no theories on how to address the online student attention deficit learning gap until about a year ago, when I toured the University's Virtual and Augmented Reality Business Unit (VARBU). There, I saw multiple VR applications developed for teaching, including immersive 3D video of the body for anatomy classes, and a 3D-modeled world of the cabin in Harriet Ann Jacobs' Incidents in the Life of a Slave Girl, for a literature class. I immediately began thinking of ways that I could incorporate virtual reality and immersive video in my online Intro to Law (undergraduate) and Law and Ethics (MBA) classes. My research indicated that several other universities were implementing VR and 360-degree video in online teaching, including the Penn State World Campus (<http://bit.ly/2pFUOEN>) and the University of Oklahoma, UMKC, and UNT-Dallas law schools.

As I set forth below, I believe using VR technology will help me reduce student distractions and increase enthusiasm for course material.

What teaching and technology interventions will close the learning gap(s) you have identified and help students achieve the desired learning outcomes?

I purchased a basic 360-degree video camera (the Insta360 One) with my own funds, and began filming and editing. I also continued my research on the technology. The American Bar Association had a special forum on VR in law teaching (<http://bit.ly/2Nywj5Q>) in 2018. The presenters identified several ideas for VR in teaching: immersive video and 3D models in the courtroom, virtual field trips, bringing the courtroom to you (remote collaboration), and self-assessment of presentation skills. Based on my research, I set out to record and edit brief examples of each of these areas.

In spring 2018, I taught the Law and Ethics course at our CIMBA campus in Paderno del Grappa, Italy. With the students' permission, I took 360-degree video of course presentations, group meetings, and my lectures. I also took video of the scenery around campus, and on a day trip I took with a CIMBA alumnus. I edited this video into a very brief demo (available here: <http://bit.ly/VRLawDemo>), which I would like to be considered as a part of this application.

First, my demo video shows the potential of immersive video in online learning. Through the use of a VR headset such as Google Cardboard, which can be purchased for less than \$15, students become immersed in the classroom setting. They are no longer watching a small video on a browser screen crowded with notifications and potential distractions. Their learning experience is much closer to the on-campus classroom, which aligns with the University's strategic goals in online learning. While they are in the immersive video, they will not have the temptation to click open other tabs, check Facebook, etc. My inexpensive 360 camera is low-resolution and 2-D, but with a better camera, the presentation will come alive in stereoscopic 3D and high resolution. Audio quality will also be much improved.

Next, my video of the student presentations shows the student presenters both how they appear, and how the full class is reacting to their presentation. By reviewing videos of their own presentations or mock trials, the students can self-evaluate and reflect on their performance and may be more open to others' feedback, according to the ABA.

Finally, I hope to expand the use of VR for "virtual field trips" to places of legal and ethical significance. I recently taped a brief video at the site of the first Lincoln-Douglas debate, and I would also like to include a virtual tour of our state and federal courthouses. I also would like to use 3D modeling to create virtual re-enactments of famous cases. Each semester I teach the Palsgraf v. Long Island Railroad case, which sets out the legal standard for proximate cause. It is a factually complicated case which involves a satchel of explosives, a railroad station, and a falling scale. Typically I laboriously describe the setting, but this year I will give a virtual walkthrough in 3D of a railroad depot I created: <http://bit.ly/Palsgraf>. This is a very crude mockup made using Google Sketchup, but if I am awarded this grant I will be able to create much richer 3D environments using Google Blocks, Tilt Brush, and other modeling software.

While these creations are much enhanced by using a VR viewer, all of them will still be viewable on a traditional web browser or mobile device in a "flat" format. Even in a flat format, students will be able to click and drag around the video (or move their mobile device) to see their virtual surroundings, leading to a richer experience. As VR viewing technology improves and becomes less expensive, I would expect the majority of students to have a VR viewer of some type within 3-5 years.

How will you demonstrate that your goals have been accomplished?

I am open to further suggestions and assistance on monitoring learning outcomes, but I identified two relatively easy measurements: course performance and course evaluations. I have several semesters of data for the non-VR versions of these classes, which I regularly teach both online and on-campus. If I see the course performance of the online students improve to near the level of the on-campus students, then I will hopefully have demonstrated that engaging videos and reduced distractions can help close the gap in student success.

I also have the ability to directly gather data from students on the course evaluations, through the standard numerical evaluations as well as custom questions. If I am awarded this grant, I will work with the OTLT to design appropriate evaluation questions regarding the VR course content and lecture videos.

What will you need?

Having the appropriate technology is very important for both filming and production of VR content. The ABA study noted that at one law school, "Going through the rendering difficulty after each recording and the need for a specialized player or device to review the videos is certainly an obstacle for an already overstretched curriculum."

I have 10+ years of experience in video editing, and have found many resources online for learning VR production. I am certainly happy to work with OTLT or DOE on filming and editing, but I feel comfortable with my technical skills at a basic level. Therefore, the primary need is just upgraded technology.

I already have a computer with Final Cut Pro X editing software, purchased through a combination of my own funds and departmental money.

I need a better video camera to fully implement my ideas for these courses. My current camera has a battery life of less than 20 minutes and shoots in low resolution 2D with low quality sound. The Insta360 Pro Stereoscopic camera shoots in 360 degrees, in 3D. It has greatly superior battery life, audio quality, and memory capacity. There is a more expensive Pro II version coming on the market, but this model is proven and well-reviewed.

I have two inexpensive VR headsets I purchased with my own funds, but a high-quality VR viewer would allow me to edit videos very quickly and to create 3D environments easily. Currently, I have to edit a 3D video in 2D, then upload it to Youtube, switch to my mobile phone, and view it on Google Cardboard. If I have to make a quick edit, the entire process must be repeated. The HT Vive Pro Starter Set is one of the best consumer-level VR viewers on the market. It is compatible with my current office computer, except that I will need an upgraded graphics card. The NVIDIA GeForce™ GTX 1060 Graphics card would support this headset and could be installed on my office computer.

What is your rough estimate of costs?

1. Insta360 Pro Stereoscopic camera: \$3,499.00 on insta360.com
2. HT Vive Pro Starter Set: \$1,399.00 on newegg.com
3. NVIDIA GeForce™ GTX 1060 Graphics card: \$309.99 on amazon.com

Total: \$5,207.99

Acknowledgment

General information

[Acknowledged]]You might want to require applicants to agree to or acknowledge certain rules or realities. Use the form below enter the acknowledgement text and require applicants to sign off on the acknowledgement before submitting their applications.]