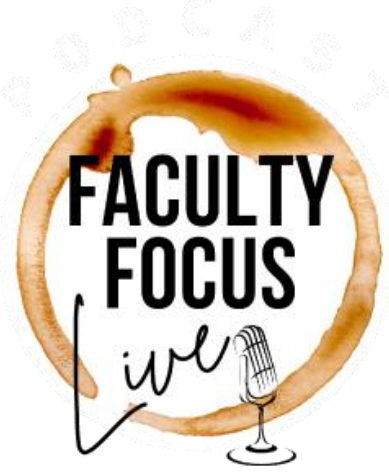

Exploring Extended Reality for Engaged Learning and Innovative Instruction

SPEAKERS
Juanita J. (JJ) Wallace, Tierney King

Tierney King 00:01
This is the Faculty Focus Live podcast. This episode is sponsored by the Teaching Professor Online Conference. Join us from the comfort of your own home and transform how you teach with nationally recognized teaching and learning presenters. I'm your host, Tierney King, and I'm here to bring you inspiration, energy and creative strategies that you can utilize in your everyday teaching. Some buzzwords lately have been VR, AI, XR, AR, and MR. So today, we're going to be talking about virtual reality, mixed realities, augmented reality and extended reality. To guide us through this, JJ Wallace will start by explaining the differences between these realities, and then dive into specific tools that instructors can use. Lastly, Wallace will cover a few design aspects when creating assignments and assessments that utilize virtual reality. This will help you impact your student learning outcomes more effectively, and use best practices while creating your assignments.

Juanita J. (JJ) Wallace 01:03
When we say extended reality, or XR, we're really talking about three different things. We're talking about augmented reality, mixed reality and virtual reality. So I'm augmented reality is a little less immersive. It tends to take place on phones and iPads, sometimes computers, and that's when you can actually still see reality around you in the real world. But in some capacity, some sort of digital elements are being superimposed on your view of the real world, but you can still see the real world around you. So that's augmented reality. Examples of that would be something like the IKEA app, where you can put the couch in your house through your phone camera, or maybe other shopping apps where you can put items, there's even some now you could put clothes on yourself. You can be standing in front of your camera, and put different clothing on you. So that's more of that augmented reality. Mixed reality, on the other hand, is like augmented reality, where it super imposes that same sort of digital element. The difference is, it's interactable, and it's usually inside of a headset. So typically, mixed reality needs some sort of headset to complete that interaction, because you are going to interact with that environment with the digital element. And then that last most immersive piece, when I say VR, I'm talking about virtual reality. And that's when you're looking at a complete digital environment where nothing you see is what you see every day. So when looking at virtual reality, and how it's being used in our society, experts are telling us that it is going to grow at a rate of about 15% every year until 2030 when it reaches about $87 billion of worth - that's a lot of money, a lot of things being purchased, as

well as used. And when you look at sort of the market of who is going to be using this technology, if you take out gaming and entertainment, right, so gaming and entertainment are the biggest if you look at a pie chart, half of everything using extended reality is for games and entertainment. The other half, which is being used for healthcare, medical devices for educational purposes, workforce development and development, training, manufacturing, automotive, but these are the areas of society where virtual reality and extended reality are being used the most. And you can see that healthcare and education and workforce and manufacturing are 20% and above of companies are going to be using this technology. So we're gonna talk a little bit now about how research has shown that extended reality works in the classroom. And in what areas it can have a really great impact with something like drawing or art. So this is a really interesting example that will show you how you can use your phone to teach someone a new skill, like drawing. So this is called SketchAR, and what it will do is if you have your phone, you can use what you would like to actually draw through the video. So let's say you want to draw the face of this young lady, and it's going to show you that process through your phone. And as you hold your phone over the the blank piece of paper, you can trace it. So it's a fancy way of tracing without actually having anything but your computer camera or your phone or your computer or your tablet camera, looking at a piece of paper. Another example is something for maybe the sciences. So if you think about learning anatomy, or learning the physiology of the human body, you'll see that sometimes to pay representations in textbooks don't always give us a really good example. So there's this app is called Human Anatomy Atlas, and you can choose any part of the human body and then through your camera on let's say a tablet or a phone, you can place that object in your space. There are typically two types of VR experiences that I like to think about for education: general purposes, and that is passive experiences where the user sits, and they actually experience something with very little interaction where all they do is look around, versus more active experiences where you might actually be moving through the space or interacting with objects, or maybe other people. When we think about these more passive experiences, one of the most popular is YouTubeVR. This is an application that you can access through any virtual reality headset. It actually works just like the YouTube we think of on our phones and on our computers, it's just in virtual reality. So people have recorded 360-degree videos where you are completely immersed in a space. And you can actually watch, let's say, events as they are happening live. Let me just click through here for you. So this would be an example of someone watching something like a circus performance. And they're watching this person, and they're sitting in their chair at home, but they look like they're out in the audience that are seeing this happen in real time. Now moving a little bit forward with content. And I like this example, because it can be used multiple ways. So if you're teaching history or teaching about social justice, you might want to think about using what's called the Anne Frank House. And this is an excellent 360-degree virtual reality experience, where you actually get to walk through the Annex where Anne Frank and her family lived during the Holocaust. And you can go through there, you hear excerpts from her diary, and you get to actually see what it felt like to be in the space because they've modeled this space in real time. So that as you are moving through the space, it would feel the same dimensions that they actually experienced it. So if the rooms are small, you're you feel like you're in a small room, because the walls are close to you. So it's a really excellent, more active experience, because you get to walk through it, you get to manipulate objects, you get to click on things that allow you to then hear different stories from her diary. Another example would be to use virtual reality for training, something like giving talks or speeches - that can be a really hard thing for individuals to do. And it's a skill that we need to teach individuals and I found this really interesting application that you can use. And it's an interactive application, where you

it's called virtual speech, and you actually give your presentation in front of a virtual audience. And it gives you feedback, you would be standing in your virtual reality headset, giving your actual speech, practicing it, and then you would have this virtual audience and you can choose how much you want your audience to, let's say participate. So maybe you want people to look like they're falling asleep, or you want them to heckle you or something, something ridiculous like that you can turn those settings on. And it might be that you can see how distracted you become. It tracks things like how much eye contact you had with your participants, how many times you stumbled on your words, and it tells you do you need to speed up? Do you need to slow down when you're speaking? So it's a really interesting application. This would be the end product here: How many words per minute did you speak? Are you too loud? Do you need to look more in one direction or the other? Really great feedback. Cool. My last example for what virtual reality looks like is the Google Earth that you can do in virtual reality. Many of you might be familiar with Google Earth through a computer where you can travel, you can have virtual storytelling, you can see places that people may have only heard of, well, in virtual reality. It looks completely immersive. It is amazing. I actually just turned on this application on my own VR headset just last night, and I was standing on beaches in Hawaii last night. And I'm actually in Kentucky right now. So it was amazing. So that's virtual reality. That's augmented reality. So now, what is the metaverse? When I say metaverse what do I mean? This has been a really interesting term in terms of trying to figure out what people mean when they say it. When we say I'm going online, the digital world, we think we know what that means at this point. But what does it mean to be in the in the metaverse? So the metaverse is actually defined as a virtual reality space in which users can interact with computer generated environment that they can also interact with other users. So you can think about being in a chat room, right? If you're on Facebook Messenger or if you're posting things to Instagram or making Tik Tok videos, that's digital interaction. However, in the metaverse, you actually get to be with other people. You're no longer using just text-based or video-based. You can interact, you can shake hands with someone in virtual reality, you can dance with them, you can give them a high five, and you actually feel that feedback from your controller. Your controller will shake or vibrate when things like that happen. So it's a really different way of interacting with the world.

Tierney King 09:52
As you begin to think about how you can use some of these tools in your own courses, you also want to consider how you can create meaningful moments that still impact student learning. By applying Bloom's taxonomy to VR applications, you can help supplement the implementation plan of using VR in your course.

Juanita J. (JJ) Wallace 10:10
There are three easy steps that you can take to create a VR assignment. The first is to identify the learning outcome that you are going to target with your VR assignment. The second is to find research VR applications that you might potentially want to use. And last step three is to create a plan using best practices as a guide. VR should always be tied to your learning outcomes, you should use VR strategically, as well as sparingly it should not be an everyday activity. However, when you use VR, you need to realize that research has shown us that it can positively impact learning outcomes. Because students will be more engaged, they'll spend more time on task and they'll start to acquire cognitive psychomotor and affective skills. When you're tying VR to your learning outcomes. It's always important to be reflective of Bloom's taxonomy. And VR can be utilized at all levels, the levels of understand and

remember, apply and analyze, evaluate and create. We think about the lower order of Bloom's so the remember in the understand sections, VR applications 360 video, all of these immersive applications can be used to help your students be introduced to new content, as well as help them to understand persons, places, things and events. You may have your students watch a video of a protest to better understand a particular topic. Or you may want them to watch a video about the heart anatomy to help better understand how the body works. Lower order Bloom's is perfect for virtual reality, especially those 360 videos. When you think more about the middle part of Bloom's, the apply and analyze sections, because VR is so interactive, your students can participate in events, in stories, they can interact with people, with places, with things, with their environment. And this interaction helps them to analyze and apply materials and content. This level of participation helps your students interact and manipulate the information you are teaching them. At the top of Bloom's, we have the evaluate and the create sections. Students are absolutely able to both evaluate and create information in virtual reality. Students can create their own custom applications, or games or 360 videos. Students can create art or other digital content within games and within applications. There's an application for almost every type of activity that you would like your students to engage in. There are applications for art and drawing, and engineering. There are applications that will allow you to do things like mind mapping. Your students can create a lot of content in virtual reality. Once you have identified or found the learning goal that you want to use, you can then move on to step two, which is researching and evaluating VR applications that are going to meet your learning goals. So first, faculty need to take the time to search for these applications. If you're looking at just video and you want your students to consume content, you may be able to search applications like YouTubeVR, which is a place where both individuals as well as companies and businesses are creating 360 content and uploading it for use in the entertainment industry as well. YouTubeVR is a great place also for your students to upload their own content. You can also look at other studios that are creating 360 applications and winning awards for IT major awards like Emmy Awards and Academy Awards. Studios like Felix and Paul have won awards for various types of videos that they created in 360. You may also want to take a look for applications in games. These are a little different than the videos, these applications and games, you're gonna have to do a little bit more in depth research on them, you might want to actually take a look at your headset developers application store. That's the first stop you want to take a look there see what you can find on the topic that you fit on the topic of interest. You might also take a look at a place called Steam. This is a place where indie developers can individuals can upload their VR games is in content, and it can be purchased or free for individuals to use. You can also do a simple browse or search for VR content while in the headset. This can help you find those websites that are creating 360 content that you can then click a button that allows that content to be viewed 363 160 degrees.

Tierney King 15:22
Whether you're driving to work, or you just did a 15-minute think session, we hope the Faculty Focus Live podcast will inspire your teaching, and offer ideas that you can integrate into your own course. For more information on the resources included in this episode, please check out the links provided in the episode Description.