Introduction to Immersive Realities for Educators

Contents

retention (Huang et al., 2010; Rizzo et al., 2006; Hussein and Nätterdal, 2015). They also assist with online and distance education courses to reduce attrition.

Finally, in many instances, you will understand your own subject matter better, such as virtual tours of locations around the world, scans of the human body or virtual recreations of the galaxy, there are examples that cannot be seen in videos or photographs.

What are the options for VR?

While VR technology has been around since the 1960s, headsets have really only been commercially viable since 2013. There are two basic types of headsets- standalone and tethered. Tethered headsets act as a display for another device, such as a PC or video game console. Standalone headsets are all-in-one systems that have all necessary components to provide virtual reality experiences integrated into the headset. Here is a list of both types of headsets. In addition, there are a number of devices that convert a standard smartphone (iPhone or Android) into a VR headset. These headsets use lenses and a head mount into which the smartphone slides. Here is a c

How is Virtual Reality generally being used in education currently?

[VIRTUAL REALITY IN EDUCATION: AN OVERVIEW](#)
[Virtual Reality Feels More Like Classroom Reality](#)
[How VR In Education Will Change How We Learn And Teach](#)

[Virtual Reality Advances Bring New Possibilities to Higher Education](#)
[EDUCAUSE 2019: What Can a Virtual Reality Classroom Bring to Your Campus?](#)

Best Practices

What are some of the best practices to consider?

[Best Practices for Using Virtual Reality in Education](#)
[Best Practices for Virtual Reality in Higher Education](#)
[VR Best Practices](#) (K-12)

Are there developers that can create content for me?

Show Me Virtual   St. Louis-based Immersive Reality company
Top AR/VR Developers
Top 10 Companies Working on Educational AR/VR

Recommendations for Immersive Realities

Immersive Reality technologies, including Augmented Reality (AR) and Virtual Reality (VR), are like any other technology used to introduce, support, or reinforce course learning objectives. As such, the assessment of learning associated with this technology does not need be any different either.

Virtual Reality is simply a learning tool or material, not unlike a text or a film or a field trip to a museum. It is a means for students to come in contact with course content,
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can work
with appropriate instructional support staff to become familiar with existing

travel, cost, and/or logistics of gathering a class for training make an alternative attractive.

shared experiences of a group in a shared environment are important.

the experience of creating a simulated environment or model is important to the learning objective.

information visualization is needed, manipulating and rearranging information, using graphic symbols, so it can be more easily understood.

a training situation needs to be made really real.

needed to make perceptible the imperceptible.

developing participatory environments and activities that can only exist as computer-generated worlds.

teaching tasks involving manual dexterity or physical movement.

essential to make learning more interesting and fun.

needed to give the disabled the opportunity to do experiments, and activities that they cannot do otherwise.

mistakes made by the learner or trainee using the real thing could be devastating and/or demoralizing to the learner, harmful to the environment, capable of causing unintended property damage, capable of causing damage to equipment, or costly.

Pedagogical Considerations

Consider course learning objectives and whether virtual reality can help students achieve desired outcomes. If students can benefit from immersion and interaction with 3D representations related to course content, VR may be an appropriate activity.

Start small. The goal is to get students familiar with the technology at first and build from there. You may want to consider requiring students to watch a short 2-5 minute documentary or a short exploratory app that has them navigate one room. Include low-stakes introductory assignments that allow students to familiarize themselves with the hardware and software, especially if requiring for those online or not using the equipment in the lab.

Design or identify a VR activity that aligns with course objectives. Identify VR applications that relate to course content in a meaningful way. Consider the placement of this activity within the course schedule. For example, a VR experience might either precede or follow discussion of the material during a typical class session depending on instructional goals. Consider scaffolding assignments just as you would with other projects. Is fully integrating into a course, begin with short, introductory experiences that are less than five minutes and on-rails. Build to those that allow them pre-exploration of an environment, and finally longer documentaries or educational resources it takes 15-20 minutes. If requiring an app that is not free, make sure to include it in the initial instructions to the class and the syllabus.

Make plans to measure student learning, aligning assessments with learning goals and activities. Some options include a pre-assessment prior to the VR experience and a post-assessment after, traditional quizzes, tests in addition to student reflections on their VR learning experiences. Depending on the VR application chosen, a student might also obtain feedback in real-time while participating in the VR experience.

Allocate time and resources for students to learn how to use VR. This can include providing students with opportunities to become accustomed to using VR software.

Clearly articulate the goals of the virtual reality activity to the students and how it will help them achieve learning outcomes prior to the start of the activity. Emphasize that the VR technology is a tool to support their learning. Generally, VR is used to reinforce or further explain topics already covered in class through lectures, readings, and videos. Once students have an understanding of what will be covered, VR will give them a more engaged experience to understand it more thoroughly. Exceptions include anatomy and physiology applications with assessments built in.

If you are teaching a class on campus and want to require a VR assignment be sure to give a span of a week or two depending upon how many students are in the class given the limited number of headsets available in the labs

Alternatively, You can require an assignment if using mobile apps or smart phones.

If you are teaching a class online consider widely available apps. Google Cardboard is a good option with many free apps. Alternatively, speak with your dean about requiring all students in the school to purchase Quest 2 with financial aid.

Consider alternatives for students that suffer from VR sickness. VR sickness is common in first time users and can be minimized with shorter introductory experiences. Instructions are provided below, but adjusting the headset straps and distance between lenses also helps. Students that wear glasses should also remember to use the spacer. An alternative would be to use Augmented Reality (AR) on a smartphone instead of a VR app. If a required assignment, try to avoid anything longer than 15 minutes if on-rails, or an app that guides the users view through an experience.

Assignment Considerations

Students can discuss their experience and whether or not they found it useful for better understand the subject matter that week. Discord is a good alternative platform to consider for such discussions. This approach allows the instructor to leverage students to find appropriate apps for the class.

- o **Quizzes:** Have students find an app relevant for the content covered in class that week that is not among those the instructor provides the class. Students then input into weekly quiz and write a short reflection on their experience and whether or not they found it useful for better understand the subject matter that week. This approach allows the instructor to leverage students to find appropriate apps for the class.
- o **Supplemental Experience Assignment:** Watch a lecture in class or online and complete the associated readings. Have students search for and find an

experience because it does not allow for positional or hand tracking

Lynda.com offers a course on how to capture 3D objects with a traditional still camera via photogrammetry (See: **3D Scanning with a Camera**).

Moving from 3D Print Models to VR Experiences

- o In most cases, the digital models used for 3D printing may also be used in a wide variety of VR applications. Some are plug-and-play and other solutions require 3D and programing knowledge. In many cases, viewing an object in VR will give a better understanding of what the object may look like when finished printing. Additional annotation elements can also be added depending on whether the software is used to enhance instruction, or create further instructional elements with the proper software development.

As an example, the website **Sketchfab** showcases a variety of 3D objects viewable in VR through a web browser.

Unity is a popular development platform for a variety of VR applications (See: Unity 3D Essential Training (Lynda.com).

GitHub For those looking to develop their own applications, this site has millions of developers that create and share software for free. You can copy and paste code from Python, HTML, etc.

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A list of educational applications can be found here in a document that is continuously updated. Apps are released on a weekly basis and, therefore, new additions will be made as their relevance for each field is reviewed.

Educational Applications Database

The database includes general educational applications relevant to a range of disciplines and then specific examples for different areas.

Recording in VR

There are three user-friendly ways to stream, record, or cast your experience in Oculus to hold a class live or record a session and share at a later date with a class.

How to Stream with Oculus Quest 2 and Quest Streaming

ADA Compliance: Wander can be played sitting or standing.
First, create your avatar, which is how you will appear to others. Next, make sure to purchase and [download the Wander app](). Be sure to power your headset up completely or your microphone will be faint to others. After familiarizing yourself with the functionality, start starring locations to be used in a multi-player sessio

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