

Virtual Reality

A Guide to VR in Medical Education

April 2022

What is Virtual Reality?

Virtual reality, or VR, is the use of computer technology to simulate an environment that can be explored in 360-degrees. Most used in entertainment applications, virtual reality is also used in education and training to immerse the user into the simulated environment. There are three primary categories of virtual reality: non-immersive, semi-immersive, and fully-immersive.



Non-immersive VR: Non-immersive virtual reality allows the user to stay aware and in control of their actual physical location. These experiences rely on a computer or video game console to interact with the software. A common example of non-immersive VR is video games.

Semi-immersive VR: Semi-immersive virtual reality places the user in a partially virtual environment. This technology uses three dimensional images to immerse the user in the simulation.

Fully-immersive VR: Full-immersive virtual reality gives users the most realistic simulation experience, complete with sight and sound. This category of VR relies on the use of hardware, such as glasses or headsets, to immerse the user in the VR environment mentally and physically.

How is VR Used in Medical Education?

Virtual reality can provide repeatable training in a controlled environment, allowing trainees to make errors and adapt behaviors without affecting actual patient care outcomes. First used to simulate surgical environments, virtual reality can now be programmed to simulate a multitude of health care settings.

Virtual reality offers medical educators the opportunity to “script” interactions and scenarios based on established learning objectives. VR can be used as a formative and a summative tool to develop and test learner’s knowledge and skills. In addition, VR can provide training opportunities previously deemed too logistically complex for widespread implementation, such as mass casualty scenarios. An example of ACLS training in VR is available [here](#).



How Does VR Get Developed for the Classroom?



Virtual reality development begins in a similar fashion to other simulation development: by mapping out a clinical scenario. Start with the learning objectives for the scenario. What do you need learners to know and be able to do?

Plan out how learners will interact in and with the virtual environment. What needs to be digitally present to create an accurate, immersive virtual reality environment? What needs to be incorporated or built for your

scenario? Do you need vitals or other clinical information available? What resources will the learner need to fulfill their assigned task?

Work with the OEI team and our consultants to discuss the clinical scenario and begin the programming process. The process will involve selecting an environment and necessary “assets” to place within it. For example, do you need a surgical suite? An ambulatory clinic room? An intensive care unit room? Is there equipment users need to use, such as blood pressure cuffs or scalpels? The team will work with you to build the environment and workflow for your scenario.

Once the scenario is built, you want to test it using trusted colleagues or student learners. Have them go through the virtual reality scenario and provide feedback on the experience to help you refine it before implementation. Does the scenario help you to accomplish your learning objectives? Can you tell if the learners know and can perform what you need them to?

How Can I Use VR in My Teaching?

Simulation has long been used in clinical education. Virtual reality offers an opportunity to provide simulation experience in a digital format.

Virtual reality allows learners to apply their knowledge to practice and learn from mistakes in a safe environment. Placing an emphasis on active learning, it focuses on improving competency and autonomy, skills expected of learners today. These repeatable scenarios provide a consistent learning experience for large groups of students, something very difficult to achieve in the clinical setting.

Incorporate virtual reality into your clinical simulation portfolio to teach skills such as CPR, communication, critical thinking, and clinical reasoning.



For more information on virtual reality at MCW, please contact us at educational_improvement@mcw.edu