

VR Learning: Environment Scan



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Introduction

A range of research studies have highlighted the effectiveness of VR in enhancing learning experiences. [Zakaria \(2020\)](#) and [Mahmoud \(2020\)](#) reviewed the use of VR in formal learning and both emphasize the potential of VR to supplement real-world experiences, with the latter finding that immersive VR significantly increases learning gain. [Allcoat \(2018\)](#) found that VR can improve performance, emotion, and engagement compared to traditional and video learning methods. However, [Schott \(2020\)](#) cautions that while VR can be effective for experiential education, it also presents challenges such as motion sickness. These findings underscore the potential of VR in creating engaging and effective learning experiences, particularly when used to supplement real-world experiences.

Environmental Scan: Four Case Studies

Taking into account the benefits and limitations of VR learning identified in the literature, we identified four real-life case studies of VR being used to create immersive learning experiences that we think offer a good overview of the potential offered by VR learning in a range of contexts: case studies 1 and 2 focus on VR for nursing, cases 3 and 4 focus on VR to prepare students and workers for the complexity of different workplace interaction contexts. The case studies are detailed below.

The following considerations emerge from the scan:

- As with any new technology, it is easy to overuse the technology out of excitement and not because it is the right delivery mechanism for a particular learning objective and context. Given the costs associated with VR learning environments, it is important to consider the time and technology costs and weigh them against the expected learning relevance and benefits before translating existing learning experiences into VR.
- A “paired” VR experience is a viable option. In this type of configuration, one learner is active and using the VR headset while the other, the “driver”, navigates a pre-set scenario. This works best in cases where the scenario branches and the driver is in control of the branches.
- Pre-briefing and de-briefing are useful mechanisms that encourage reflection and align with the International Nursing Association for Clinical Simulation and Learning Guidelines. This is something that should accompany the VR experience.
- The low-risk environment provided by VR allows students to gain confidence while building their skills, including empathetic communication.

Case 1: Nursing Students Enter Virtual Reality World

Link to Article	Nursing students enter virtual reality world
Link to Case Study	The University of Manitoba Chooses UbiSim in Program Expansion to Address Nursing Shortage
Category	VR in Health
Learners/Audience	Undergraduate nursing students at the University of Manitoba
Technology used	UbiSim
Objectives	<ul style="list-style-type: none"> ● Provide University of Manitoba nursing students with a safe and engaging environment to practice their skills before working with real patients ● Allow nursing students to fulfill their clinical hours in the face of insufficient in-hospital clinical spots ● Provide a more immersive remote option for clinical practice that replicates the experience of being at a patient's bedside ● Replace screen-based simulations used during the pandemic; point-and-click technology was not robust enough and the college wanted to replace it with an immersive experience
Cost/funding information	<p>No cost information provided.</p> <p>The project benefited from \$50,000 of funding was provided through donation by Dr. Ernest Rady.</p>
Where was training facilitated	The University set up VR learning rooms with a total of 11 workstations at the Helen Glass Centre for Nursing
Training scenario	Paired Experience: Students work in pairs - one student is the "active player" who wears the headset and hand controls and is completely immersed in the 3D environment, while the other

	<p>student is the “driver”. The active player takes on the role of a nurse, caring for the patient in a pre-programmed scenario. The driver acts as the patient by selecting pre-recorded responses for the patient, and the active player speaks to the patient accordingly.</p> <p>In some pre-recorded scenarios, family members are also characters in the VR environment so the active player has to multi-task by caring for the patient and also interacting with the family members, allowing them to practice empathetic communication.</p>
Notable results	<ul style="list-style-type: none"> • Students are excited to practice and develop their skills in a safe environment • VR scenarios replicated the crucial multi-tasking skill that nurses have to develop • Both students are active participants as the “active player” is engaged in the simulation and the “driver” has to think critically about what could be the next step in the nurse/patient interaction • Students feel more engaged
Reported Challenge	None stated

Case 2: MCN students practice real-life scenarios in virtual reality

Link to Article	MCN students practice real-life scenarios in virtual reality
Link to Case Study	Mennonite College of Nursing Expands Simulation Offerings With Immersive Virtual Reality
Category	VR in Health
Learners/Audience	Undergraduate nursing students at Mennonite College of Nursing at Illinois State University
Technology used	12 scenarios that are a mix of pre-created and customized scenarios
Objectives	<ul style="list-style-type: none"> • Provide a safe environment where students can practice and perform without the risk of potentially harming a patient • Provide guaranteed repeatable encounters in a physically and psychologically safe

	<p>environment</p> <ul style="list-style-type: none"> ● Supplement existing simulation lab ● Decrease costs associated with in-person simulations (actors, set, teardown) while preserving immersive learning experience ● Provide students the opportunity to engage with high-acuity, low-occurrence events (HALO) (i.e. preeclampsia or preterm labour)
Cost/funding information	<p>No cost information provided.</p> <p>Funding was provided through Provost Academic Enhancement Funds.</p>
Where was training facilitated	MCN's Nursing Simulation Lab
Training scenario	<p>The 12 simulations are a mix of pre-created and custom scenarios.</p> <p>Before simulations, students and instructors pre-brief together based on the INACSL (International Nursing Association for Clinical Simulation and Learning) guidelines. Once the simulation is complete, there is a student-only debrief followed by peer evaluation. Then, students run through the scenario again as a group with a faculty member for a more comprehensive debrief.</p>
Notable results	<ul style="list-style-type: none"> ● VR scenarios provide a blueprint for how students will handle a situation, giving instructors the ability to work with them individually on their strengths and weaknesses ● Used by 3 undergraduate courses with approximately 1000 simulation sessions per year ● Can move students through virtual reality so much faster than in-person simulations - reduces the costs compared to in-person simulations. ● Scenarios that can be created in VR are much more realistic than what can be recreated with a mannequin ● Debriefing is crucial as it allows students to reflect and internalize what to do in the scenarios ● Students enjoy the autonomy
Reported Challenge	Initial learning curve with new technology

Case 3: Walmart Embraces Immersive Learning

Link to case study	Case study: Walmart embraces immersive learning
Category	VR in Customer Service/Interpersonal Skill Development
Learners/Audience	Walmart associates
Technology used	Oculus Rift devices and Strivr's VR training platform
Objectives	<ul style="list-style-type: none"> • Provide Walmart associates with an immersive and interactive training experience for learning to handle complex customer interactions without disrupting the customer experience • Replace the traditional classroom learning (lectures and quizzes) with a design that better replicates the heightened experience of dealing with customers in the flow of work • Roll out training to all 200 Walmart training centers and eventually to all 4,000 store locations in the US
Cost/funding information	No information provided
Where was training facilitated	Walmart's 200 Academies (training facilities located inside select stores across the US)
Training scenario	<p>Walmart rolled out the following pilot scenario:</p> <p>The company partnered with Strivr to create a VR training program that would allow associates to learn by doing, in a low-stakes environment. The program was designed to be scalable and cost-effective.</p> <p>30 minutes of footage filmed using a 360-degree camera during Black Friday was used to build a VR training module. This pilot module provided trainees with an opportunity to experience a chaotic and high-pressure scenario in a controlled environment.</p> <p>Trainees wore VR goggles while an instructor talked through what was happening and</p>

	identified where associates did the right things and what they should watch out for.
Notable results	<p>Trainees who took the VR training reported a 30 percent higher satisfaction rating compared with trainees attending traditional courses, and the VR trainees scored higher on content tests 70 percent of the time. Those in VR training demonstrated a 10-15 percent higher rate of knowledge retention compared with those in traditional training.</p> <p>The 20-minute VR experience replaced a 90-minute classroom training, saving both time and money.</p>
Reported Challenge	Not conflating the excitement for the technology with good candidates for a VR learning environment. The Walmart team took time to develop a list of what subjects would be worth the time and cost needed to translate the current training method into a VR one.

Case 4: Cappfinity VR EY Summer Internship

Link to YouTube	Cappfinity VR EY Summer Internship
Link to Article	Cappfinity Partners With EY to Deliver VR Internship Journey that Builds Skills and Confidence
Category	VR in Business
Learners/Audience	UK based EY (Ernst & Young) Interns (university students and recent graduates)
Technology used	Single and multiple-player activities and scenarios.
Objectives	<ul style="list-style-type: none"> Provide interns with greater insights than traditional internship programs into the authentic working environment at EY

	<ul style="list-style-type: none"> ● Give interns access to all levels of the EY ecosystem ● Enable students to gain confidence and a greater understanding of their own skills and competencies ● Better immerse, train, and develop EY technology interns
Cost information	Not provided
Where was training facilitated	Not provided
Training scenario	<p>Internships were a blend of in-person and virtual experiences. For the virtual component, EY interns followed a five-week, self-led journey using a VR headset provided by EY. The VR headset was preloaded with different tasks, experiences, and activities, and gave the intern the ability to virtually join meetings with other interns and colleagues at different levels, interact with simulated clients, and learn how to make a pitch to sell an idea.</p> <p>For example, a week 1 task could be to sit in virtually on a meeting with a fictional energy client, leading up to a week 5 task of pitching technology solutions for that client to senior EY stakeholders.</p>
Notable results	<ul style="list-style-type: none"> ● 92% said the internship made them more curious to learn about tech consulting ● 100% said their understanding of client projects had improved ● 100% said they were more confident attending business meetings than they were before the internship ● 83% said they were more confident using these new technologies ● 83% of the interns said they now view EY as a very tech-centred company
Reported Challenge	Not provided